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# FREE TRADE IMPACT ANALYSIS

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1989 Rates

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# THE ECONOMIC AND LOAD IMPACTS OF THE CANADA-US FREE TRADE AGREEMENT

Economics and Forecasts Division

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## EXECUTIVE SUMMARY

The purpose of this study is to assess the economic and load forecasting implications of the Canada-US Free Trade Agreement (FTA) for Ontario Hydro. Two key variables of interest for Hydro revenue planning are the impact on electricity demand and on the Canadian dollar exchange rate. In order to forecast the impact on electricity demand, it is necessary to develop forecasts of the impact of the FTA on Ontario industries, and a large part of this report is devoted to that effort.

Most studies of the Canada-US Free Trade Agreement (FTA) conclude that it will have a favorable but relatively modest economic impact. Tariffs between Canada and the United States are already quite low as a result of previous trade agreements. About 80% of Canadian exports presently enter the United States duty free, and about 65% of US exports enter Canada duty free. As far as tariff reductions, per se, are concerned, the Free Trade Agreement is a quite minor continuation of much larger reductions that have taken place over the previous two decades. However, as a broader treaty governing trade relations it is expected to have a beneficial psychological effect on investment in Canada, because it reduces (but does not eliminate) the risk of sanctions arising from protectionist US trade policies. In addition to this boost to investment, the tariff elimination and more competitive economic environment are likely to lead to a more efficient scale of operation in Canadian industry, and therefore a slightly higher level of productivity.

Post-Agreement forecasts of the ultimate increase in Canadian GDP (in the year 1998, when the Agreement is fully implemented) resulting from the FTA range from 1.2 percent to 4.3 percent. Hydro's estimate of the overall impact on Ontario real GDP, at 3 percent, is near the middle of that range. Even if the FTA's overall impact on GDP is positive, there will inevitably be a negative effect on many individual companies. Moreover, there is a likelihood of a small negative impact on GDP in the early years in which the economy and companies go through the transitional adjustments to the FTA. The economic forecasts therefore indicate only relatively modest gains occurring over a long

period of time, and many individual workers would probably have to be relocated in order to achieve the productivity gains. Consequently, some people who accept this type of economic forecast oppose the implementation of the FTA because they focus on these and other costs. The social and cultural implications of the FTA were considered to be outside the purview of this study, but we do not deny their potential significance.

One of the reasons for the expected negative effect of the FTA in the early years is that the Canadian dollar has risen partly in response to the financial investment prospects which result from the FTA. This is, of course, happening years in advance of the improvements in productivity which might result from the FTA, and so the immediate effect is a reduction in the competitiveness of Canadian exports. We conclude that the value of the Canadian dollar near 81 US cents reached recently is probably unsustainable for the next few years. The increased capital inflows resulting from the FTA are expected to place the Canadian dollar in the 77 to 80 cent range in the next few years, with a possibility of further appreciation in the 1990s if the FTA is successful in reducing Canadian inflation.

There could conceivably be some future implications for electricity pricing and export sales flowing out of the FTA. The Canadian and US governments will continue to negotiate on the definition of subsidies, which remains an unresolved issue. Last year, a group of US coal mining interests and utilities accused some Canadian electricity exports of being subsidized (a view which Hydro rejects). In the short term, the FTA appears to reduce the likelihood of such a trade action being brought against Canadian electricity exports.

Our study looks not only at the total macroeconomic effect, but also at the impacts on the major industrial categories of output. This was done partly with an input-output model of the economy, which predicts the industrial impact of any change in GDP. The results of the input-output model were then adjusted to reflect the effects of the relative tariff rate changes which are occurring for different industries, by taking into account relative elasticities of demand and the cost competitiveness of different industries. The non-metallic minerals, primary metals and paper industries were found to grow more than the

average of manufacturing. The food and beverage, rubber and plastics, and printing and publishing industries (while still showing some positive growth) were found to grow considerably less than the industrial average. When the results of these industrial forecasts were input into the end use load forecasting model, it was found that the increase in electricity demand would be just slightly larger than the increase in Ontario GDP.

## Summary of the Main Quantitative Conclusions

- Ontario real GDP is substantially unaffected by the FTA during the first four years of the agreement, because the productivity improvements are expected to emerge slowly. However, by 1998, real GDP is expected to be about 3 percent higher than it would have been in the base case.

- Total employment in the province is expected to decline slightly in 1990 and 1991 as a result of free trade, but it is expected to rise 0.6 percent by 1998.

- The Canadian dollar will rise about 3 cents (relative to a base value of 75 US cents) as a result of increased capital inflows resulting from free trade. In the 1990s, productivity improvements resulting from free trade may further improve Canada's competitiveness (assuming monetary policy is unchanged), which could allow the dollar to trade in the 80 to 85 cent range in that decade.

- The higher real GDP, plus the industrial mix of output increases, were used to predict the impact on electricity demand. The six largest electricity consuming industries were predicted to increase their electricity consumption by 3.56 percent as a result of the FTA. The total increase in load is predicted to be 3.14 percent.

## Overview of the Report

The first chapter provides a brief history of Canada-US trade relations, plus a survey of other studies of the economic impacts of free trade.The second

chapter describes the overall impact of the FTA on the economy, plus our assumptions about its investment implications. The third chapter covers the impact on the Canada-US exchange rate, and in order to do this it describes in detail the analytic model which was used. The fourth chapter provides both a qualitative and a quantitative description of the likely effects of free trade on the main electricity consuming industries. The nine major industry groups covered account for about 85 percent of electricity consumption in Ontario manufacturing. The final chapter analyzes the impacts on electricity consumption by individual industrial sectors, and the economy as a whole.

## 1.0 SURVEY OF OTHER STUDIES ON FREE TRADE

### 1.1 Historical Perspective

Canada's manufacturing industries had enjoyed some protection since the 1850s. In 1879 the federal government introduced the National Policy, which was designed to foster the development of manufacturing, mainly in central Canada, and to stimulate the growth of population and resource-based industries in western Canada. Its combination of protective tariffs, immigration and transportation policies effectively secured a hinterland for the manufactures of Ontario and Quebec, providing markets and to a lesser extent raw materials. This "pattern of interregional trade and specialization that developed in the first two decades of the National Policy has not changed substantially to the present day" (Pinchin, 1979).

The end of the Second World War was a turning point in international economic relations. The General Agreement on Trade and Tariffs (GATT) was adopted in 1947, providing the framework for seven successful rounds of multi-lateral trade negotiations. The Tokyo Round, which was fully implemented in 1987, has brought the trade-weighted average of import duties levied by Canada and the United States down to 7.9% and 4.4%, respectively. More specifically, 65% of US exports to Canada now enter duty free, and an additional 26% faces tariffs of 5% or less. In return, the United States allows 80% of Canada's industrial exports to enter the country duty free, with almost 95% at a tariff rate of 5% or less.

The successive tariff reductions implemented in the 1960s and 1980s as a result of the Kennedy and Tokyo Rounds should have produced a much freer world trading system. But the outcome is clouded by the increasing use of non-tariff barriers in recent years. A commonly used practice is the imposition of quotas such as those on cars, shoes and clothing. Other NTBs may be more subtle but their effect is similar; these include licensing, labelling, packaging and purchasing preferences. Unlike tariffs, NTBs are, on balance, somewhat higher in the United States than in Canada. Tariff equivalents of the NTBs are

estimated to be in the neighbourhood of 1.7 to 1.8% of price protection in the United States, compared to 1.0 to 1.4% in Canada (Department of Finance; and Economic Council of Canada). Nonetheless, tariffs have remained the single most important bilateral trade barrier in both countries.

Tariff and non-tariff barriers aside, domestic producers in the United States may seek protection through temporary measures, which under certain conditions are permitted by the GATT. In principle, these import relief measures are triggered by what are perceived to be "unfair trade practices" such as dumping (ie, selling in export markets at prices below those in domestic markets) and government subsidies to business. Few of these measures are currently in force. However, they have been refined into a popular harassing technique, whereby the mere initiation of an investigation can impose substantial administrative and legal costs on Canadian exporters. Moreover, the uncertainty caused by the threat of an anti-dumping or countervail action makes it difficult to develop market plans. Canadian industries that were the subject of US investigations included steel, lumber, fishing, livestock and meat products.

## 1.2 Economic Arguments for Freer Trade

The traditional trade theory holds that a country should specialize in production of the goods in which it has a "comparative advantage". Through trade with one another all countries become better off. This logic is challenged by Canadian nationalists on the ground that because Canada has a comparative advantage in natural resources, opening up the border would lead to de-industrialization and turn Canadians into "hewers of wood and drawers of water".

It is useful at this juncture to review the evolution of Canada's manufacturing base over the years. There is no question that the industries have been built behind a tariff wall. Indeed, foreign and domestic tariffs have had the combined effect of creating a domestic manufacturing sector geared primarily toward serving the small Canadian market. Industries that could not otherwise exist are able to survive in the absence of real foreign competition. The development has yielded a fragmented industrial structure characterized by short production runs and inefficient plant sizes.

Another by-product of the high tariffs has been the establishment of branch plants in Canada. Because of the many similarities between the two countries, a US-based company would be able to adapt, with relatively small costs, its market advantage (embodied in a patent, trademark, or the reputation for a reliable and quality product) to Canadian conditions. This is generally known as a "miniature replica effect", in which the Canadian subsidiary mimics the more elaborate product lines of its US parent.

Trade liberalization in the postwar period has not caused the disappearance of Canadian industries. Rather, the degree of specialization has increased significantly to take advantage of economies of scale provided by the additional access to US and overseas markets. By cutting back on the diversity of products and by making fewer goods at larger scale, Canadian manufacturers lower costs and raise productivity. Furthermore, the "miniature replica effect" is lessened. In its place is world product mandating. Under this practice, the foreign-owned subsidiary no longer sizes its output to the small Canadian market. Instead, it is given the responsibility for the development, production, and marketing of a particular product world wide. Consumer choice is not reduced, however. Products not made in Canada may now be imported, giving consumers a better selection and most likely a lower price at the same time.

Although much of the overall adjustment takes the form of the less painful intra-industry type, resources do move from slow-growth, labour-intensive industries - where Canada has little or no comparative advantage and suffers from deep import penetration - to industries with the opposite characteristics. Hence, manpower and capital of, say, clothing and shoes are released to more competitive industries such as telecommunications equipment. In this way the economy is made more efficient.

Scale economies and allocative efficiency are only the better known benefits of free trade. The contribution of increased competition should not be underestimated, however. The domestic market in Canada is sufficiently small that a handful of suppliers may be able to exercise effective control over it. They

can do so as long as foreign competitors are hampered by trade barriers. Under free trade, their oligopolistic power to influence price is severely curtailed, if not entirely eliminated.

Further liberalization of trade with the United States - which is this country's largest partner, accounting for 80% of total exports - will only reinforce the trend toward a more efficient and highly competitive Canadian economy. In fact, Canada is expected to gain more than the United States (Hamilton and Whalley, 1985). Since the US economy is large and already very competitive, the removal of Canadian trade barriers is unlikely to generate the kind of productivity improvement expected for Canada. In any case, the United States is far less dependent on foreign trade.

Because this is a bilateral arrangement, imports from Canada may replace imports from third countries in the US market (Cox and Harris, 1986). But trade diversion or trade creation of this nature is found to be small (Hamilton and Whalley, 1985). On the other hand, it is observed that industries which are highly protected in Canada are also receiving high rates of protection in the United States. With freer trade, competition will intensify in the domestic market, but these Canadian producers can also use the opportunity to expand their exports.

## 1.3 Survey of Studies

The potential impacts of free trade on Canada have been a subject of intense study with the onset of the bilateral negotiations. This survey only covers recent research and is focused on real output and employment.

### 1.3.1 Survey Results

During the delicate negotiations, little was known about what was and what was not on the table. Researchers were left to venture a guess what the agreement, if reached, might include. As a result, the different estimates presented in Table 1.1 are partly a reflection of the different assumptions used. Nonetheless, there is a consensus that:

(1) Canada's economic output is expected to be higher, ranging from 1.3% to as high as 10%. It should be pointed out that studies such as Cox and Harris (1986) tend to overestimate the benefits because their assessment is based on economic data that have not reflected the full effect of the Tokyo Round tariff reduction.

(2) The employment impact is somewhat mixed, but seems to be generally positive. (Dungan notes that the negative effect only shows up in the end years and is related to the assumption of a "rather rigid monetary policy".)

(3) Except for Lazar's calculation, Ontario's economy should perform at least as well as the Canadian economy, and is likely to fare better. (Lazar's study totally ignored the job creation potential of free trade, and focused only on the areas of potential job losses.)

The Canada-US Free Trade Agreement (FTA) was reached in early October, 1987, but the final wording was not resolved until December. It will be a while before the Agreement is fully assessed and its impacts analyzed. Even so, Table 1.2 should give a very good preview of what to expect. In general, there are no surprises. The preliminary assessment is very much in line with the pre-FTA studies though the benefits now tend to reside at the lower end of the range. (At a University of Toronto conference held in December of 1987, Harris gave an estimate of 3.2% as the increase in Canada's GDP.) The lower estimates are consistent with the view that the agreed arrangement is more limited in scope than was originally envisaged. Agricultural marketing boards, for instance, will be little changed by FTA.

It is clear from the survey that free trade, or rather, freer trade is not going to cure Canada's economic problems or create a large improvement in the incomes of Canadians. What FTA does is to create a (relatively) free trade zone in North America. Hence, most producers in the two countries can treat

TABLE 1.1

Gains from Free Trade (per cent): Pre-Agreement Studies

| Study | Canada | | Ontario | |
|---|---|---|---|---|
| | Output | Employment | Output | Employment |
| Cox & Harris (1986) | 8 to 10 | N/A | N/A | N/A |
| Dungan (1985) | 3.3 | -.17 | 3.8 | 0.21 |
| Economic Council of Canada (1987) | 3.3 | 2.6 | 3.2 | 2.5 |
| Hamilton & Whalley (1985) | 1.3 | N/A | N/A | N/A |
| Lazar* (1986) | N/A | N/A | N/A | -3 to -7 |
| Informetrica (1985a) | 2.0 | 0.8 | 2.4 | 0.7 |
| Wharton Econometrics (1987) | 3.1 | 1.7 | | |
| Wigle (1988) | 1.5 | N/A | | |

*Manufacturing

TABLE 1.2

Gains from FTA: Post-Agreement Studies

| Study | Output (per cent) | | Employment |
|---|---|---|---|
| | Canada | Ontario | Canada ('000) |
| DRI (1988) | 1.2 | N/A | 168 (or 1.1%) |
| Dept of Finance (1988) | 2.5 | 2.7 | over 120 |
| Informetrica (1987) | 2 to 3 | N/A | 100 to 200 |
| Wharton (1988) | 2.7 | N/A | 250 |
| Conference Board (1988) | 1.7 | N/A | 150 |
| Dungan and Wilson (1988) | 4.3 | N/A | N/A |

TABLE 1.3

**The Potential Impact of US Protectionism on Canada**

| Study | Output (per cent) | Employment (thousands) |
|---|---|---|
| Economic Council of Canada (1986) | -5.0 | -525 |
| Dept of Finance (1988) | | -75 (or more) |
| Harris* (1986) | -8.0 | -79 |
| Informetrica (1985b) | -3.4 | -256 |

*Ontario only

the continent as one big market, and compete on the basis of price and quality without the impediment of trade barriers, both visible and invisible. Indeed, for a large number of Canadian companies, such as those exporting steel and forestry products, the major benefit of FTA is not so much a lower custom duty as secure access to the all-important export market. To them the alternative to free trade is not the status quo but growing US protectionism. As Table 1.3 indicates, given Canada's dependence on the United States, the loss of access to that market could be devastating, inflicting heavy economic costs.

### 1.3.2 Employment Impact on Ontario

The FTA will have three broad effects on Canada's employment (Wonnacott, 1986). It

- Reduces employment owing to the loss of domestic sales by Canadian firms to imports from the United States;
- Increases employment as the direct result of a reduction in the US trade barriers, which leads to more Canadian exports;
- Will help to maintain existing employment by securing for Canada exemption from US protectionist actions.

In an oft-quoted study, Ontario Ministry of Industry, Trade and Technology (1985) classifies the province's manufacturing into:

| Industry Type | Characteristics |
|---|---|
| Highly Sensitive | Significant trade protection;<br>Vulnerable to import penetration;<br>Low export orientation. |
| Sensitive | Significant protection;<br>Sensitive to imports;<br>High export orientation. |

| | |
|---|---|
| Less Sensitive | Low levels of protection;<br>Competitive in domestic and US markets. |

Contrary to some impressions, this study did not actually make any concrete predictions about job losses or job gains. The quote that the FTA will put "281,000 Ontario jobs at risk" refers to the highly sensitive industries only. The study also identifies 275,000 jobs in the sensitive industries and 107,000 in the less sensitive industries. Both of these groups are expected to benefit from trade expansion with the United States. If, as Wonnacott (1986) argues, the domain of employment expansion actually exceeds the domain of employment contraction, then the net employment effect will be positive.

In summary, there appears to be a fairly strong consensus among economists who have produced quantitative studies of the Free Trade Agreement. They have generally found that it will have a positive effect on economic growth. However, inasmuch as average tariffs were already quite low before the FTA, its total impact is likely to be relatively small.

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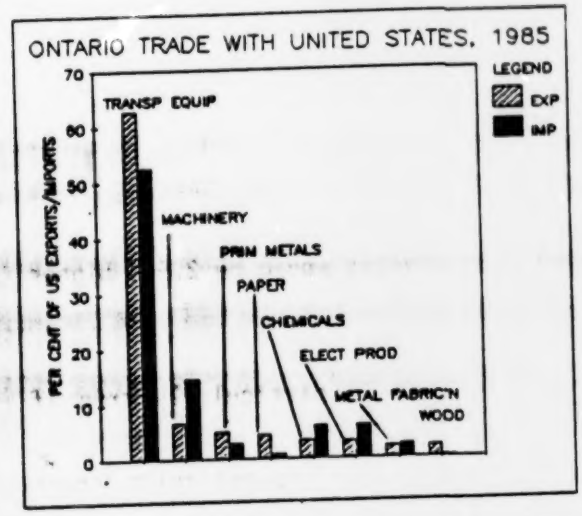
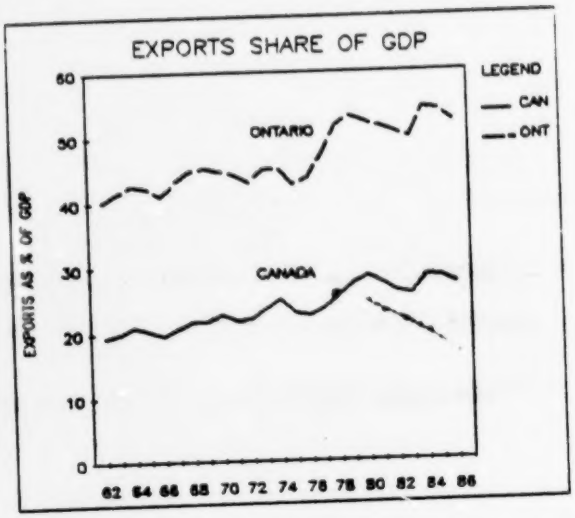
## 2.0 MACROECONOMIC OVERVIEW OF THE IMPACT ON THE ONTARIO ECONOMY

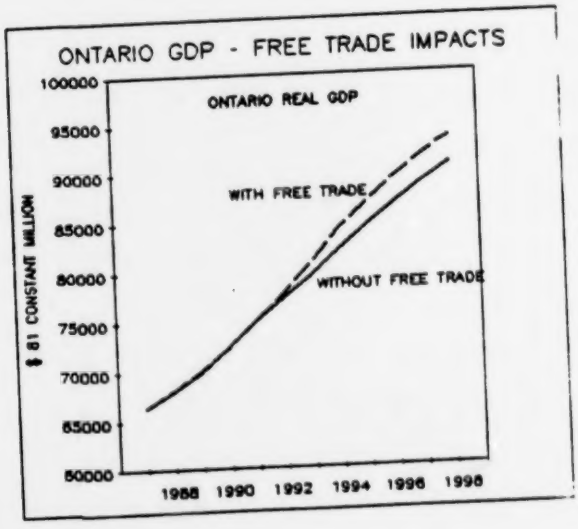
This chapter discusses our findings with respect to the overall "macroeconomic" impact of free trade on Ontario real GDP growth and employment. The production of these numbers involved an iterative process using two models: the Economics Division's ONTEC macroeconomic model of the Ontario economy, and Statistics Canada's provincial input-output model, which describes the detailed inter-industry linkages in the Ontario economy. There are some aspects of the impact of free trade which no existing quantitative model can properly address, since free trade will lead to structural changes, and because these models are not normally called on to evaluate tariff changes at a detailed industry specific level. Some of these changes had to be predicted judgmentally, such as the impact of the easing of foreign investment controls. Others (such as the impact of tariff reductions on detailed trade flows) came from quantitative calculations carried on outside the models, based on information we received from the Ministry of Industry and Trade. These individual sources of influence were then added back into the ONTEC model, which calculated an overall impact on GDP.

Our analysis of trade focussed on the specific industry impacts caused when scheduled tariff reductions were phased in. It was assumed that all tariff changes would be fully reflected as changes in the import or export price of each product. Import and export price elasticities were applied to these resultant prices and shifts in the quantity of exports and imports were calculated. Further, based on a particular industry's competitiveness vis-a-vis its US counterpart, import penetration and export orientation were estimated. Any increase in imports was assumed to replace domestic production whereas increases in exports were assumed to be additions to Ontario production. The direct impact on output was the difference between exports and imports, this being spread out over the 1989 to 1998 period according to each industry's tariff removal schedule.

In order to capture the indirect and induced impacts on other industries as well, Ontario input-output multipliers based on the 1979 interprovincial model


ONTARIO TRADE WITH UNITED STATES, 1985
LEGEND
EXP
IMP
PER CENT OF US EXPORTS/IMPORTS
70
60
50
40
30
20
10
0
TRANSP EQUIP
MACHINERY
PRIM METALS
PAPER
CHEMICALS
ELECT PROD
METAL FABRIC'N
WOOD


EXPORTS SHARE OF GDP
LEGEND
CAN
ONT
EXPORTS AS % OF GDP
60
50
40
30
20
10
0
ONTARIO
CANADA
62 64 66 68 70 72 74 76 78 80 82 84 86


ONTARIO GDP - FREE TRADE IMPACTS
$ 81 CONSTANT MILLION
100000
95000
90000
85000
80000
75000
70000
65000
60000
ONTARIO REAL GDP
WITH FREE TRADE
WITHOUT FREE TRADE
1988 1990 1992 1994 1996 1998

developed by Statistics Canada were applied to the direct trade impacts for each industry as discussed in Chapter 4 below.

Over the first 10 years of the free trade agreement, the total impact on the Ontario economy was estimated to be a 2.95% increase in real GDP. In other words, this analysis suggests that because manufacturing tariffs were eliminated, because of fewer restrictions on investment and because of freer trade in services, Ontario's output of goods and services would be 2.95% higher than without free trade.

Moreover, this probably understates the case. This is particularly true if free trade is compared not to a base case which merely maintains the status quo but to one which assumes a much more restrictive and protectionist trade environment on the part of the United States.

Putting this in perspective, a 2.95% gain in Ontario's total output of goods and services over a ten-year period seems fairly insignificant when compared with the 5% decline in real GDP during the 1982 recession. Moreover, when such impacts are broken down to an annual level and spread out over many industries the discernible results are almost too small to measure.

Probably one of the most interesting facts we learned from this analysis of free trade was that in order to shift Ontario's future growth substantially the shock to the economy had to be much more severe than that of tariff removal. Even though trade is of vital importance to the provincial economy (much more so than to Canada), our largest industries (vehicles and parts, pulp and paper, aircraft, smelting and refining, etc) account for the lion's share (70 to 80% of both exports and imports) of our trade with the United States. They are generally our most competitive industries, are generally export oriented and in most cases already operate in a virtually duty-free environment. As a result, tariff changes, since they affect such a small share of total trade, cannot have a major effect on the total economy. Moreover, while undoubtedly there will be negative repercussions for some industries, the negatives are hardly likely to be universal. On the surface, Canadian industries have much more to lose in free trade, because our tariffs, currently averaging 11.3% (in th

relatively few industries where they still exist), are more than 3-1/2 times higher than American ones. On the other hand, we have much more to win because the American market is so much larger than the Canadian one.

The quantitative impacts of free trade on the key economic variables are shown in Table 2.1, as drawn from simulations with our macroeconomic model of the Ontario economy. In addition to the total impact, this table decomposes the impact according to three individual effects of free trade: its effect on investment, its direct effect on the trade balance (due to the removal of tariffs), and its effect on productivity.

Of these three elements, the removal of manufacturing tariffs between 1989 and 1998 stood out as being negative, causing Ontario's trade surplus to decline by 0.7% by 1998. Total exports did rise by a scant 0.2%, but imports expanded by 0.3%. This analysis probably overstates the negative influences of the Canada/US tariff differential. There was no real attempt to deal with likely product specialization in specific industries, trends in export orientation, competitiveness or manufacturers' expected aggressiveness in breaking into US markets. It was not surprising that the net effect of these trade shifts on Ontario's total output of goods and services was negligible as well, causing a 0.3% decline in real GDP from the base case. The trade effects were estimated to cause a loss of 6-1/2 thousand jobs and a 0.2% reduction in consumption.

However, free trade is expected to be beneficial to capital investment, which in turn will have indirect and induced impacts on various industries, together yielding an aggregate 1.1% addition to GDP by 1998. Changes to foreign investment regulations along with the increased trade resulting from tariff removal are judged to prod industries into undertaking capital investments which boost capacity and raise productivity and competitiveness. The aggregate effect will be to augment investment by 3-1/2% over the first 10 years of the agreement. The chain effects producing the 1.1% increase in GDP include hikes of just less than 0.6% to personal income and 0.5% to consumption. Over the 10 years Ontario employment was affected more by investment than by trade or productivity. By 1998, increased capital outlays had produced 24 thousand new jobs in the province.

Total factor productivity, however, stood out as the single most important influence on economic growth. Assuming a modest 0.2% per year improvement in productivity due to free trade yields a 1.9% boost to GDP. Employment benefitted with a net gain of 10-1/2 thousand jobs. The total gain in productivity is both the most important and the most uncertain assumption in the whole process of studying the impact of free trade. There can be no purely objective prediction of this improvement. It depends partly on the potential size of cost reductions which could take place if all opportunities for rationalization and economies of scale were used, which is itself fraught with measurement uncertainties. It also depends on the strength of entrepreneurship in Canada, which will determine whether these opportunities are fully exploited. As time has passed, researchers' estimates of this gain have tended to decline, and we have adopted a value which is close to the middle of the current range of estimates.

Based on the numbers described above, we can be reasonably confident that the long-run aggregate impact of free trade would be positive. There is, however, likely to be at least a small negative direct impact of tariff reductions in the early years of the agreement. When one considers the negative initial impact, plus the human suffering of the workers who would have to be moved around in order to achieve the productivity gains, it is perhaps understandable that many groups in society are opposed to the Free Trade Agreement. Economic predictions of the total impact, such as ours, indicate that the beneficial impacts will come slowly, and be relatively small. The fact that there is an increase in overall GDP growth resulting from the Free Trade Agreement does not mean that, even as an economist, one is obliged to view it as a desirable option.

## 2.1 The Impacts on Capital Investment

Ontario's investment record since the late 1970s has been nothing less than spectacular. In relative terms, we have invested more than either the United States or any of the other Canadian provinces. This suggests that recent outlays for new plant and equipment will enable our industries to compete more

effectively in a North American free trade environment. Moreover, under free trade, the pattern of future investment becomes exceedingly important. It may be that the areas attracting the most investment decisions will be based on many factors, including the Canada/US exchange rate, the entrepreneurial spirit and competitiveness of Canadian versus American companies, costs of capital, labour and materials, tax differences between the two countries, etc.

The bulk of evidence to date suggests that Canadian investment will increase as a result of the freer flow of trade between this country and the United States. Moreover, our analysis concluded that Ontario, because of the particularly positive investor attitudes surrounding the province right now and because of its greater concentration of manufacturing industries as well as the higher export orientation of those industries, would attract a disproportionate share of any additional Canadian investment. This was based on the following factors:

- that US investment in Canada would increase because of the changes to Investment Canada outlined in the FTA (ie, raising the review threshold on new acquisitions from the current $5 million to $150 million)

- that removal of US tariff barriers on manufactured goods would, because of the vast opportunities created by the US market, lure increased offshore capital to Canada.

- that outflows of Ontario capital south of the border would be reduced once US tariffs were removed

- that increased trade and the increased competition that customarily goes with it would lead to an upturn in the capital intensity (capital/output ratio) of manufacturing industries

- that a general expansion of capacity would be required once the positive effects of free trade became felt in other areas of the Ontario economy. Scrappage of old machinery would accelerate as well under conditions of more intense competition and higher productivity.

The aggregate effect of the above was to boost Ontario capital investment by 3-1/2% (in real dollar terms) by 1988. This analysis concentrated almost entirely on the manufacturing sector since we felt, that the almost complete tariff removal on manufacturing industries would give them the major share of any effects. Furthermore, services have a much lower ratio of capital to labour than do goods.

Foreign Capital Inflows

There was a marked reduction in the amount of foreign capital entering this country between 1981 and 1986. In fact, only US investment dropped. Most of it was tied to the huge decline in oil prices and the corresponding slump in oil sector activity. Unfortunately, data are not available detailing recent US investment-activity in specific geographic locations and specific industries. We only know that despite the spate of American capital flowing into Ontario's auto sector between 1984 and 1987 and despite the fact that sizable shifts in exchange rates have in many instances made labour costs much cheaper in Canada than in the US, the percentage of US control of Ontario assets has generally been on a declining trend since the mid-1970s, falling in Ontario manufacturing to 66% in 1984.

In direct contrast, outlays by other foreign countries in Canada have risen substantially. Expenditures by Asian auto manufacturers are of particular note. Sizable exchange rate shifts occurring since 1982 have had a huge impact on the profitability of Japanese producers who ship to the North American market. Canada, because of her wage rate advantage over the US in the auto sector, has become a very desirable destination for Japanese investment. When US tariffs are removed under free trade, these foreign plants located in Canada (assuming they fulfil the 50% content requirements) will have virtually free access to the American market.

Moreover, our analysis suggested that while the initial exchange rate reactions to free trade would be positive, the Canadian dollar would not rise much above

80 cents US. In other words, the increase in the dollar will not be enough to erode the current wage rate advantage which exists in many Ontario industries.

Canadian restrictions on foreign investment currently in existence may have done little in a concrete or quantifiable way to dissuade American investment in Canada (few proposals were rejected by Investment Canada), but the restrictions definitely exerted very negative psychological influence. Therefore, it seems logical to assume that any easing of these old restrictions, such as raising the threshold for review of foreign acquisitions from the current $5 million to $150 million, the prohibition of performance requirements, and national treatment for establishment of new businesses as outlined in the Free Trade Agreement, would have a positive impact on US investment in Ontario.

In summary, we felt a free trade agreement would boost foreign investment in Canada by 10%. We assumed that Ontario would attract at least 40 to 42% of this investment (slightly more than her historical 37% share). However, while beneficial to the Ontario economy, this additional investment would still account for less than 5% of the province's total capital outlays.

Capital Outflows to the United States

In the reverse situation, Canadian investment in the United States was estimated to decline under free trade and such funds would, instead, be invested at home. Canadian expenditures in the US have risen dramatically over the past 10 years, more than doubling between 1975 and 1979 and almost quadrupling between then and 1987. High US tariffs in specific areas as well as an escalation in US protectionism have undoubtedly been influential factors. Without such negatives, Canadian companies would no longer have to set up their own plants south of the border in order to tap the extra sales potential. Under free trade, US locations offer scant advantage (other than possibly cheaper transportation costs). This is especially true if exchange rate differences keep certain costs cheaper in Canada.

Under free trade, the outflow of capital from Canada to the US was assumed to decline by 10% and to be invested in Canada instead. As in the case of capital

inflows, we assumed that Ontario would attract 40% of this investment, slightly more than if free trade were not instituted.

Capital Intensity

Trends in capital intensity play an integral part in any forecast of investment. It is extremely important to any analysis of free trade because many of the factors influencing capital output ratios have to do with trade. Capital intensity (defined as the amount of capital stock used to produce a given quantity of output) has grown dramatically over the post war period; the trend being especially evident in the goods producing industries: manufacturing, electric utilities and mining. Capital output ratios, especially in manufacturing, have risen for many reasons. The most important, however, has been the huge increase in oil prices which in turn have necessitated fuel substitutions and conservation and the shift to more sophisticated production techniques necessitated by increased world competition.

It has also been found that foreign controlled companies generally spend more on research and development than do Canadians and that foreign owned businesses are more capital intensive than domestic. Therefore, given that foreign investment in this country is expected to increase under free trade, capital output ratios can also be expected to rise as a result. The actual impact of a 10% annual increase in foreign investment on capital output ratios, however, turned out to fairly insignificant over the 1989 to 1998 period.

Another important consideration is that as tariffs are reduced Ontario industry will be prodded into becoming more specialized, more efficient and more capital intensive as competition in the trade arena increases. Historical analysis shows that following the tariff cuts associated with each of the various Rounds of the GATT, there was not only a sizable upturn in the importance of trade to our national economic growth but in time capital intensity rose as well.

We assumed that since tariffs would not be reduced as much in the case of bilateral free trade as they had been under the various GATT Rounds, that the

impact would not be as substantial as in the past. Exports as a percentage of Ontario GDP rose from 41% of GDP in 1967 before the Kennedy Round to 52.6% in 1987 following the final phase of the Tokyo Round. This share was assumed to rise to 56.2% by 1998 in our base case. It seemed reasonable that free trade would boost this an additional 1-1/2 percentage points (to 57.7%) over 10 years, certainly not excessive when compared with the 10-1/2% increase which occurred after the Tokyo Round and the 3% after the Kennedy Round. Moreover, considering the notable increase in importance of international trade (mainly with the US) to Ontario as opposed to interprovincial trade over the past 10 years a 1-1/2% increase in the export/GDP ratio is fairly insignificant. North American trade has always flowed more normally north/south than east/west, but high tariff barriers have prevented this from occurring. The marked shift in Ontario trade patterns mentioned earlier (Ontario's concentration on US trade rather than trade with other parts of Canada) has coincided with major reductions in tariffs between the two countries. Logically this north/south orientation will intensify with bilateral free trade so that not only will exports increase, but US trade will continue to assume larger and larger shares of total Ontario trade.

Summary

In summary, the aggregate effect of eliminating tariffs reducing non-tariff barriers and easing restrictions on foreign investment was to boost total capital outlays by 3-1/2% between 1989 and 1998. Although investment directly accounts for less than 20% of Ontario's GDP, the spinoffs on the rest of the economy are quite large. The net effect, therefore, was to raise economic output by 1.1% over the first 10 years of the agreement.

The initial reaction was immediate and positive as manufacturers scrambled to become more competitive, more specialized and to expand capacity. By the early 1990s, however, the first investment cycle was complete. Negative impacts on certain industries became apparent, capacity was more fully utilized and productivity hikes now occurring were sufficient to yield required output. By 1992, the model estimated that a second investment cycle would begin, with outlays forecast to remain strong throughout the remainder of the 10 year period.

# TABLE 2.1

## 1. GROSS DOMESTIC PRODUCT

| | Base Case (Winter Review/88) | Invest-ment | % Impact | Trade | % Impact | Produc-tivity | % Impact | Total Combined Effects | % Impact |
|---|---|---|---|---|---|---|---|---|---|
| 1985 | 60,227.98 | | | | | | | | |
| 1986 | 63,617.28 | | | | | | | | |
| 1987 | 66,293.70 | | | | | | | 68,049.41 | 0.17 |
| 1988 | 67,932.22 | 68041.3 | 0.16 | | | | | 70,049.81 | 0.28 |
| 1989 | 69,850.92 | 70043.3 | 0.28 | 69,826.66 | -0.03 | 69,869.89 | 0.03 | 72,262.18 | -0.09 |
| 1990 | 72,328.06 | 72256.4 | -0.10 | 72,275.09 | -0.07 | 72,349.98 | 0.03 | 74,935.27 | -0.05 |
| 1991 | 74,973.48 | 74929.8 | -0.06 | 74,887.30 | -0.11 | 74,993.60 | 0.03 | 77,730.26 | 0.66 |
| 1992 | 77,222.24 | 77364.7 | 0.18 | 77,110.21 | -0.15 | 77,608.98 | 0.50 | 80,847.33 | 1.69 |
| 1993 | 79,507.13 | 79944.4 | 0.55 | 79,367.59 | -0.18 | 80,439.80 | 1.17 | 84,083.81 | 2.53 |
| 1994 | 82,005.19 | 82516.8 | 0.62 | 81,839.20 | -0.20 | 83,606.73 | 1.95 | 86,626.94 | 2.73 |
| 1995 | 84,323.18 | 84778.0 | 0.54 | 84,132.78 | -0.23 | 86,210.58 | 2.24 | 89,125.07 | 2.97 |
| 1996 | 86,552.67 | 87263.7 | 0.82 | 86,332.59 | -0.25 | 88,453.41 | 2.20 | 91,376.37 | 3.10 |
| 1997 | 88,632.26 | 89592.8 | 1.08 | 88,380.66 | -0.28 | 90,459.40 | 2.06 | 93,235.59 | 2.95 |
| 1998 | 90,565.20 | 91529.7 | 1.06 | 90,282.81 | -0.31 | 92,320.13 | 1.94 | | |
| 1999 | | | | | | | | | |
| 2000 | | | | | | | | | |

## 2. EMPLOYMENT

| | Base Case (Winter Review/88) | Invest-ment | Actual Impact '000 Jobs | Trade | Actual Impact '000 Jobs | Produc-tivity | Actual Impact '000 Jobs | Total Combined Effects | Actual Impact '000 Jobs |
|---|---|---|---|---|---|---|---|---|---|
| 1985 | 4,394.01 | | | | | | | | |
| 1986 | 4,511.20 | | | | | | | | |
| 1987 | 4,629.57 | | | | | | | 4,676.98 | |
| 1988 | 4,669.00 | 4,676.55 | | | | | | 4,794.98 | 12.00 |
| 1989 | 4,782.99 | 4,794.79 | 11.80 | 4,781.27 | -1.72 | 4,784.00 | 1.01 | 4,890.15 | -9.52 |
| 1990 | 4,899.67 | 4,890.08 | -9.59 | 4,896.17 | -3.51 | 4,900.46 | 0.79 | 4,954.50 | -7.19 |
| 1991 | 4,961.69 | 4,954.48 | -7.20 | 4,956.76 | -4.92 | 4,962.01 | 0.32 | 5,064.73 | 32.42 |
| 1992 | 5,032.31 | 5,040.27 | 7.96 | 5,026.92 | -5.39 | 5,057.32 | 25.01 | 5,195.21 | 82.82 |
| 1993 | 5,112.39 | 5,139.55 | 27.16 | 5,106.79 | -5.60 | 5,169.18 | 56.79 | 5,337.03 | 111.67 |
| 1994 | 5,225.36 | 5,251.12 | 25.76 | 5,219.68 | -5.68 | 5,312.57 | 87.22 | 5,436.95 | 94.45 |
| 1995 | 5,342.50 | 5,356.17 | 13.68 | 5,336.73 | -5.77 | 5,424.49 | 82.00 | 5,451.37 | 81.03 |
| 1996 | 5,370.33 | 5,395.49 | 25.15 | 5,364.10 | -6.23 | 5,427.34 | 57.01 | 5,469.40 | 62.79 |
| 1997 | 5,406.61 | 5,441.08 | 34.47 | 5,400.24 | -6.37 | 5,436.36 | 29.75 | 5,485.92 | 33.38 |
| 1998 | 5,452.54 | 5,476.82 | 24.28 | 5,446.06 | -6.47 | 5,463.03 | 10.49 | | |
| 1999 | | | | | | | | | |
| 2000 | | | | | | | | | |

# TABLE 2.2

MACRO EFFECTS OF FREE TRADE ON THE ONTARIO ECONOMY
(using ONTEC Model)

INPUTS

| | Capital Investment | | % | Real Exports | | % | Real Imports | | % | Net Real Trade | | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Base Case | Free Trade | Impact | Base Case | Free Trade | Impact | Base Case | Free Trade | Impact | Base Case | Free Trade | Impact |
| 1985 | 12,979.93 | | | 24,480.58 | | | 21,952.78 | | | 2,527.80 | | |
| 1986 | 14,400.83 | | | 25,187.34 | | | 22,917.34 | | | 2,270.00 | | |
| 1987 | 15,259.01 | | | 27,146.97 | | | 24,381.04 | | | 2,765.93 | | |
| 1988 | 15,806.68 | 15,883.54 | 0.49 | 29,395.23 | | | 25,651.59 | | | 3,743.64 | | |
| 1989 | 16,661.87 | 16,793.76 | 0.79 | 30,957.49 | 30,966.36 | 0.03 | 27,291.39 | 27,297.10 | 0.02 | 3,666.10 | 3,669.26 | 0.09 |
| 1990 | 17,543.46 | 17,494.76 | (0.28) | 31,941.52 | 31,954.21 | 0.04 | 28,279.11 | 28,290.40 | 0.04 | 3,662.41 | 3,663.81 | 0.04 |
| 1991 | 18,459.76 | 18,456.56 | (0.02) | 33,519.28 | 33,537.11 | 0.05 | 29,459.98 | 29,476.71 | 0.06 | 4,059.30 | 4,060.40 | 0.03 |
| 1992 | 19,010.51 | 19,115.61 | 0.55 | 35,318.97 | 35,343.58 | 0.07 | 30,714.01 | 30,740.25 | 0.09 | 4,604.96 | 4,603.33 | (0.04) |
| 1993 | 19,638.97 | 19,950.42 | 1.59 | 36,604.55 | 36,635.98 | 0.09 | 31,622.08 | 31,659.73 | 0.12 | 4,982.47 | 4,976.25 | (0.12) |
| 1994 | 20,180.31 | 20,557.15 | 1.87 | 37,959.11 | 37,997.50 | 0.10 | 32,567.08 | 32,618.11 | 0.16 | 5,392.03 | 5,379.39 | (0.23) |
| 1995 | 21,013.34 | 21,386.10 | 1.77 | 39,079.52 | 39,123.53 | 0.11 | 33,711.72 | 33,775.46 | 0.19 | 5,367.80 | 5,348.07 | (0.37) |
| 1996 | 21,763.50 | 22,357.00 | 2.73 | 40,983.35 | 41,036.82 | 0.13 | 34,599.23 | 34,679.93 | 0.23 | 6,384.12 | 6,356.89 | (0.43) |
| 1997 | 22,458.64 | 23,241.48 | 3.49 | 42,004.56 | 42,067.36 | 0.15 | 35,270.15 | 35,370.02 | 0.28 | 6,734.41 | 6,697.34 | (0.55) |
| 1998 | 23,083.98 | 23,890.14 | 3.49 | 42,931.18 | 42,999.31 | 0.16 | 36,101.59 | 36,215.85 | 0.32 | 6,829.59 | 6,783.46 | (0.68) |
| 1999 | | | | | | | | | | | | |
| 2000 | | | | | | | | | | | | |

## 3.0 THE IMPACT ON THE CANADA-US EXCHANGE RATE

In the eighteen years that the current system of floating exchange rates has been in place,[1] the value of the Canadian dollar has fluctuated over a wide range, from a high of 104 US cents to a low of 69 US cents. These large short-term exchange rate fluctuations are very difficult to predict, because they are caused by transient factors such as speculative sentiment and rapid alterations in government monetary policy. However, fundamental factors do exist which underpin the value of a currency, and this enables us to analyze the likely longer-term trends in the exchange rate,[2] and to consider the impacts of major alternative policies such as the Canada-US Free Trade Agreement.

When evaluated within the framework of the model to be described below, the Free Trade Agreement is found to have a favorable impact on the exchange rate, for two reasons. One is that it would cause an increased rate of capital inflows into Canada, and the other is that it would likely reduce the Canadian inflation rate relative to US inflation. However, there is likely to be some overshooting of the dollar's value in 1988 and 1989, and this could prove harmful to Canadian exporters who are particularly sensitive to the exchange rate.

### 3.1 The Role of the Balance of Payments

The recent media attention to the trade deficit problems of the United States have created a misleading, oversimplified impression of how the balance of payments influences the exchange rate. In practice, international capital flows change far more quickly than the trade in goods and services, and these capital flows are the main short-term determinant of exchange rates. In the case of the US dollar, enthusiasm about the US economy and high real interest rates attracted a rapid rate of capital inflows in the early 1980s. That rate of inflow was unsustainable, and the US dollar has had to decline as a result. A frequently encountered misconception is the prediction that the Canadian dollar will weaken because Canada's balance of trade surplus is declining (or vice versa). The balance of trade may occasionally reflect independent changes in the underlying demand for Canada's exports, but the historical experience

has been that it usually does not. This is amply demonstrated in Chart 1, where it can be seen that Canada's balance of trade surplus was on a strong upward trend in the 1975 to 1985 period, while the value of the Canadian dollar was on an equally strong downward trend, which is just the opposite of the conventional wisdom. More rigorous econometric evidence can show that changes in the balance of trade have only a very short-term impact on the exchange rate.

The reason for this is that the current account (balance of trade in goods and services) is just one side of the balance of payments, and the latter is always more or less equal to zero.[3] The balance of payments is the sum of the current account balance plus the balance of capital flows for investment purposes. In the case of Canada, the statistical evidence is very strong that it is changes in capital flows which are the initiating factor that leads to changes in the value of the Canadian dollar. In fact, the chain of causation may be summarized as follows:

1. Capital flows change, so that money moves into or out of Canada. These flows can change very suddenly, in response either to objective factors such as changes in Canadian interest rates relative to those in the US, or subjective factors such as fears that Canadian government policy will be unfavorable to business.

2. The change in capital flows is a change in the demand for Canadian dollars, which causes the exchange rate to rise or fall. This in turn affects the quantity of foreign goods that Canadians want to buy, and the quantity of Canadian goods that foreigners want to buy. Imports and exports adjust until the balance of trade becomes equal to the volume of capital leaving or entering the country. The trends in Chart 1 are a reflection of this: because capital inflows into Canada were on a downward trend in the early 1980s, the Canadian dollar fell, creating a rising trend of trade surpluses. Conversely, in 1987 and 1988, the dollar rose in spite of the declining merchandise trade surplus which resulted from it.

Chart 1

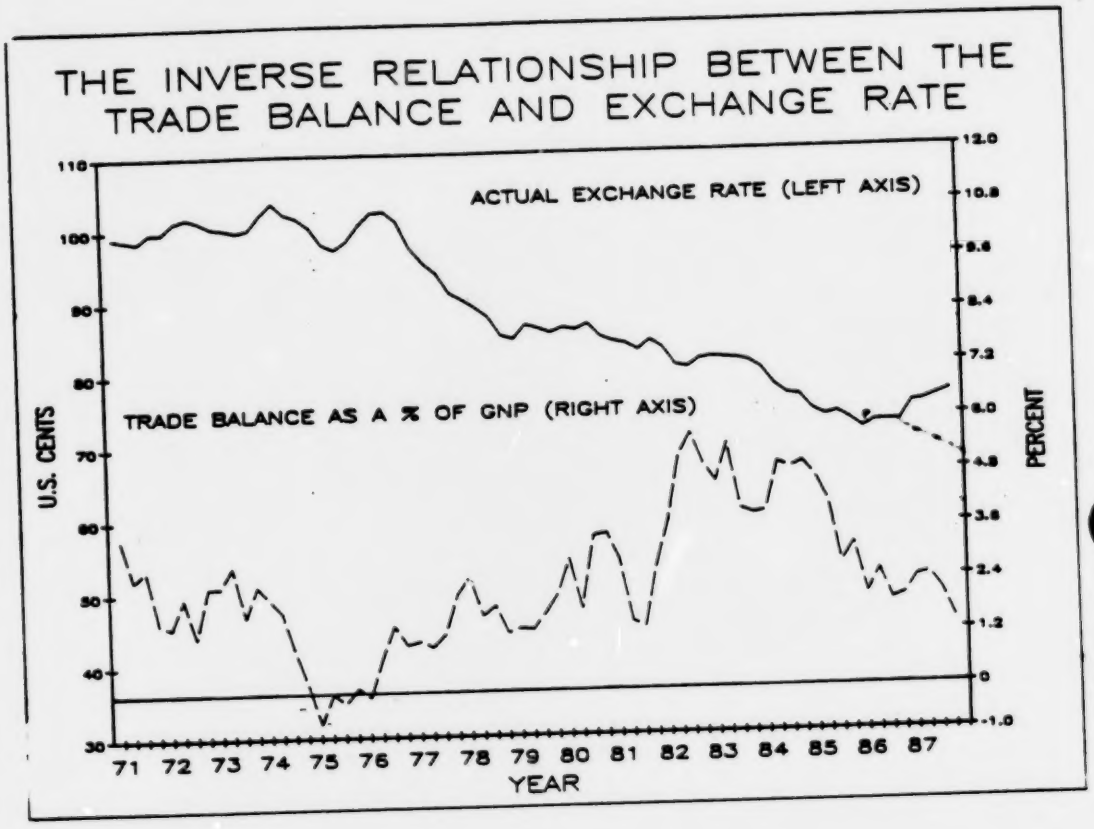
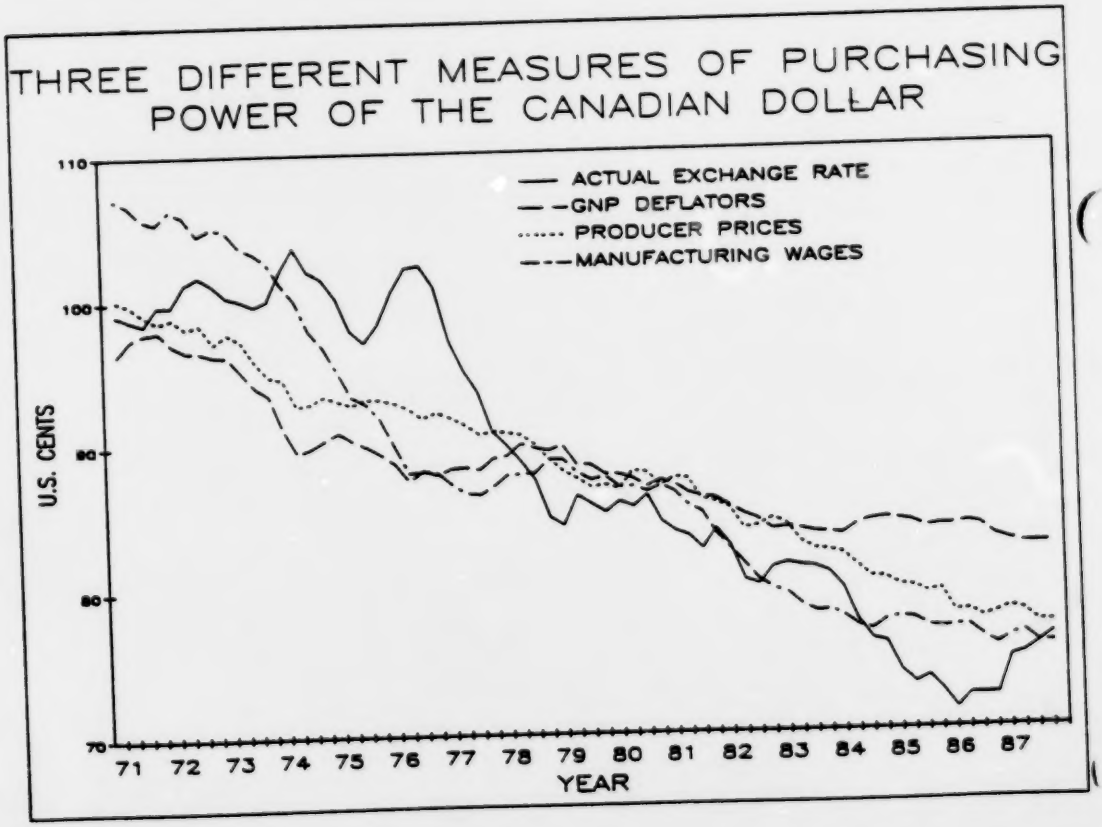



Chart 2



The implication of these findings is that the changes in the balance of trade surplus or current account balance by themselves are not useful as indicators of whether the Canadian dollar should rise or fall. That is not to say that trade in goods is irrelevant. A growing surplus implies a rising value for the Canadian dollar only if it is not the result of a declining rate of capital inflows which previously lowered the dollar. This can be identified econometrically by considering whether the Canadian dollar is over- or under-valued relative to its fundamental purchasing power. The methods to measure this are the subject of the next section.

## 3.2 Relative Prices as Measures of the Currency's Value

Besides capital movements, the other main factor which determines the exchange rate is the relative prices of similar goods in Canada versus the United States. The logic of this is simple and compelling. Suppose that inflation in Canada causes the costs of producing goods exported to the United States to rise 20%. If there has been no inflation in the United States, then the Canadian dollar must fall about 20% in order to keep Canadian exports to the United States competitive. In reality, this does not happen immediately, or precisely, because it takes time for exporters and importers to respond to new prices. However, over long periods of time it has proven to be a very reliable indicator of trends in the value of the Canadian dollar. The historical relationship over the past eighteen years is shown in Chart 2, which contains lines representing the ratios of three different US and Canadian price indexes.[4] It can be seen that the downward trend which characterized the Canadian dollar's value over most of this period is explainable by the rise in Canada's price level relative to the United States, due to Canada's higher inflation rates.

This relationship is described in economics as the "purchasing power parity" theory (PPP) of exchange rates. There is nothing magical about this theory, and its actual degree of predictive power depends heavily on the appropriateness of the price indexes used. PPP works relatively well for the Canadian to

US dollars, but not nearly as well for other currencies. The reason it works well for Canada and the United States is because the two countries have very similar industrial cost structures, and trade a very wide range of goods which are produced in both countries. This allows a broad price index to be a good indicator of how cost changes will affect trading relationships. However, if one compares Canada and Japan, one finds that trade is restricted to very narrow classes of goods. Japan has been coming out with new products (eg, home video recorders) which did not even exist when the available price indexes were constructed. Thus, PPP does not have as good a predictive ability with respect to the Canadian dollar to the yen, because the type of price index envisioned by the theory does not exist for comparing these two countries.[5]

The purchasing power parity principle is the means of bringing the demand and supply for merchandise trade into the picture of what sets the exchange rate. It reflects the fact that the demand for Canada's exports is determined by the price that is charged for them in Canadian dollars. (Correspondingly, the willingness of Canadians to supply our currency to foreigners is determined by how much we want to spend on imported goods at the going prices.)

One of the most vexing questions involved in using purchasing power parity is the choice of price index for measuring its value. The consumer price index can be ruled out, because at times Canada and the United States have had quite different methods of calculating it. Chart 2 compares the values from three different candidates: the ratios of GNE deflators, producer prices, and average manufacturing wages (productivity growth differentials between Canada and the United States are mainly cyclical, and so have been discounted in the latter). Since there is no absolute value to a price index, these have all been normalized to have the same average value as each other (and the same average value as the exchange rate) during the 1971-87 period. It is not really appropriate to try to divine the value of the exchange rate purely from this chart, since (as discussed below) economic theory cannot justify the proposition that only relative prices determine the exchange rate. Moreover, while the chart makes it appear that the GNE deflator is the least accurate predictor, this is also an incorrect impression. The multiple regression analysis results, reported in the Appendix, show that when we take the other

factors into account, the three different indices are approximately equal in their ability to predict exchange rate fluctuations.

### 3.3 Capital Flows and Other Factors Causing Changes in the Real Exchange Rate

There is no totally accepted definition of what the PPP theory is. Some economists take it to mean that there will never be any change in the real exchange rate, even in the short-term.[6] It clearly fails by this definition, because there are inevitably time lags before trade flows adjust in response to relative price changes. A reasonable theoretical view would also accept that even after a full adjustment has taken place, changes in the real exchange rate (that is, permanent deviations from purchasing power parity) are possible.

The exchange rate changes caused by capital flows are frequently transitory, as the rate of capital inflows fluctuates up and down around its trend. However, a permanent change in the trend of capital movements would cause a permanent deviation from PPP. Historically, Canada has had net capital inflows. However, as the Canadian economy becomes more developed, one can envision a distant future in which domestic savings more than cover the needs of capital investment, and Canada would become a net capital exporter such as Germany or Japan.

Capital leaving Canada represents the desire on the part of Canadians to invest in other countries. In order to do this, they must buy the foreign currency by selling Canadian dollars. Eventually, an increased outflow of capital from Canada must be offset by an increase in our net balance of trade, in order that the supply and demand for Canadian dollars be in balance. When the outflow of capital from Canada starts, it represents an excess supply of Canadian dollars on the market, causing the exchange rate to depreciate. It continues to depreciate until it has sufficiently increased the demand for Canadian dollars (by increasing Canada's net exports) to offset the increase in supply represented by the capital outflow.

Viewed another way, a decision by Canadians to change the proportion of their income they want to invest abroad means that they must sell a larger proportion of Canada' total production abroad. Real investment by Canadians in the rest of the world means that Canadians are "lending" real goods and services to the rest of the world. Canadian paper money has no value except for the goods and services it can buy. Therefore, in order to invest more abroad (or to become less dependent on foreign capital inflows) Canadians have to increase the world market share of their goods. This can only be achieved by cutting the relative price of Canadian goods in the world market (since the demand for them is not very elastic). The end result is that, if capital moves out of Canada (or comes in at a slower rate than it used to) there must be a real exchange rate depreciation, which means that the Canadian dollar falls below its value as measured by the simple purchasing power parity.

Capital inflows into Canada also bring with them the obligation of future interest and dividend payments to the foreign investors. These payments are included as service imports in the current account of the balance of payments. However, they differ fundamentally from other imports of goods and services, because (once the loan is taken out) Canada no longer has any choice about how much of these services to "import." If the Canadian dollar depreciates, Canadians can stop importing other goods and services which they now find too expensive, but these interest payments are not subject to such voluntary adjustment. Therefore, they are a distinct category of import, which are outside the influence of the relative price changes which operate on PPP. If interest and dividend payments abroad rise relative to exports of goods and services, then Canada must increase the world market share of its exports in order to generate funds to meet the interest and dividend payments. Therefore, an increase in these payments relative to exports (either as a result of higher indebtedness or an increase in interest rates on the outstanding debt) would imply a real depreciation of the exchange rate.

## 3.4 How The Free Trade Agreement May Affect The Canadian Dollar

The most obvious way in which the Free Trade Agreement is likely to affect the value of the exchange rate is through its effects on capital inflows. It is likely to be a positive effect for two reasons. One is that Canada is heavily dependent on the US, which already buys about 80 percent of our exports, even in the absence of a Free Trade Agreement. One of the greatest risks facing the Canadian economy is the imposition of arbitrary sanctions by the United States against Canadian exports. The FTA would reduce this risk, and therefore make investment in Canada more attractive (even if rates of return on investment in Canada were unchanged). Moreover, the FTA is also likely to increase the rate of return on capital, by means of productivity gains resulting from industries operating at a larger, more efficient scale. The average prediction of the regression equations presented in the Appendix is that the Canadian dollar rises about two cents for each one percentage point increase in capital inflows (when the latter are expressed as a percentage of GNP).

While the impact is likely to be positive, the estimate of the size of the impact is not subject to any very precise measurement. A large part of the impact is purely subjective, in the form of the perceived reduction in risk as viewed by investors. In the mid-1970s, capital flows into Canada were unusually high, due to simultaneous heavy borrowing by a number of provincial governments, especially for electric power investments. In 1976, net capital came into Canada in an amount equal to 4.1% of GNP, which was double the historical average rate, and contributed to the dollar being far above its purchasing power parity. By contrast, in the 1983 to 1985 period, capital inflows were depressed by poor prospects for Canada's primary industries, and averaged only 0.9% of GNP, partly accounting for the dollar's value being below PPP. For the 1972 to 1987 period as a whole, total capital inflows averaged only two percent of GNP, with a downward trend through the period. Projections of Canadian savings rates, based on demographic factors (in particular, the increase of the average age of the population) indicate that, other things equal, the downward trend would continue, with the rate of capital inflows decreasing to about one percent of GNP. Based on our study of the likely increase in investment

expenditure resulting from free trade, the implication is that it has the potential to raise capital inflows to a rate of two percent of GNP.

A potential short-term risk exists for Canadian exporters due to the currency market's initial enthusiasm about the FTA. The Canadian dollar has risen above the 80 US cent level early in 1988 (compared to a level of 72.4 cents at the end of 1986). This is not entirely because of the FTA, but it may be considered a catalyst without which the increase would not have occurred. Such an increase can be due to a pure speculative increase in the value of the dollar (unaccompanied by any changes in financial flows) or it can be due to increases in the inflow of financial capital into Canada, purchasing Canadian stocks, bonds, and bank deposits. The problem with such inflows is that they may go partly into financing increased consumption of imported goods by Canadians. The loss in output (and the increasing national indebtedness) which would result from this kind of overshooting could turn out to be one of the more serious transitional costs of the Free Trade Agreement.

The other main potential impact that free trade could have on the Canadian dollar would be through its effect on the relative Canadian and US inflation rates. Over the post-war period as a whole, average Canadian inflation (as measured by GNE deflators) has been almost one percentage point higher than in the United States. However, the bulk of that differential came in the period from 1974 to 1983, when Canada's inflation averaged 2.1 percent per year higher than US inflation, because Canada followed a much more liberal, stimulative monetary policy. (It was this inflation which severely eroded the value of the Canadian dollar in the late 1970s). In the fifteen years before that, Canadian inflation had only exceeded US inflation by an average 0.5% per year.

It is not surprising that Canada would tend, on average, to have higher inflation than the United States, because we have a smaller, more concentrated economy, with correspondingly greater elements of monopoly pricing by business, labour unions and governments. George Stigler pointed out years ago that pure economic theory does not support the proposition that monopoly leads to higher inflation. Economic theory predicts, rather, that monopolists will take prices to a higher level, but once this level is reached they will not contribute to a

higher overall rate of change of prices. However, this microeconomic theory is somewhat deficient when it comes to analyzing political interactions with the macroeconomy. The higher degree of monopolistic and regulated price setting in the Canadian economy makes prices particularly inflexible, and there is a correspondingly larger drop in output when a drop in aggregate demand occurs. Consequently, the unemployment rate rises quickly to a politically distressing level, and there is greater pressure on the Canadian government than on the US government to stimulate the economy. This is, of course, not an inevitable consequence, nor can it be counted on to repeat itself in a mathematically precise way, but it is likely to create a long-run tendency to higher inflation, other things equal.

The Free Trade Agreement has the potential to somewhat alter this relationship, to the extent that it introduces greater elements of competition and market based pricing to the Canadian economy. However, it should be noted that what we have is actually a limited Free Trade Agreement. Many of the areas of regulated and monopolized price setting have been exempted, especially agricultural marketing boards. Moreover, basic differences between the Canadian and US political cultures would no doubt remain in place, with more liberal economic policies being part of this. Therefore, while the Free Trade Agreement should reduce the average differential between Canadian and US inflation, it is still likely that Canada will continue to have slightly higher inflation (on average) than the United States. In any case, the theory of Purchasing Power Parity makes it clear that this factor does not have any significant implications for the real exchange rate. If the Canadian dollar depreciates in the future because of higher inflation in Canada, it confers no competitive advantage onto Canadian exporters. Conversely, if the FTA helps avoid devaluations of this type in the future it will not in any way harm Canadian exporters. The exchange rate would merely be reflecting the fact that the FTA has made Canadian dollar production costs lower than they would have been otherwise.

Even if the long-run Canadian inflation rate remains higher than US inflation, in spite of free trade, the FTA has the potential to lead to lower inflation in Canada during the transition period in which the economy adjusts to free trade.

If the agreement is successful, the improved productivity and reduced tariffs could produce a "one time" benefit, cumulating to as much as a five percentage point reduction in Canadian inflation. When this is added onto a PPP estimate that the dollar is worth 77 to 80 cents as of 1988, the FTA could eventually justify a value in the low to mid 80 cent range for the Canadian dollar.[7] However, these productivity gains would probably not be significant until about 1993. The fact that the recent increase in the exchange rate has anticipated most of this potential improvement so many years in advance (while there remains a risk that the FTA may not even be implemented) suggests that there is some optimistic speculative buying involved. Recent studies have moved away from the "efficient markets" view of foreign exchange trading and recognize the role of destabilizing speculation, as evidenced by Frankel and Meese (1987).

A minor source of possible influence of the FTA comes about because we are starting out with Canadian import tariffs which are, on average, higher than those in the United States. Therefore, it has been suggested that Canada may suffer a terms of trade loss as a result of the agreement.[8] It is true that Canadian tariffs are presently higher than US tariffs, but they are both very low. It has been estimated that the average level of Canadian tariffs imposed against US imports is only 2.5 percent, while the average tariff rate facing Canadian exports entering the United States is 1.5 percent.[9] The average rates are this low because the tariff on the vast majority of Canada-US trade is already zero. When we did a detailed analysis of the industrial impacts of reducing all remaining tariffs to zero (taking into account estimates of the import and export elasticities) we concluded that Ontario would be a small net loser. The net export loss in 1999 (in the case of Ontario) would amount to about one percent of total exports. The comparable figure for the national average would no doubt be smaller, since there is no significant tariff protection of non-manufacturing industries. Therefore, taking even a pessimistic view of the export demand elasticity, the terms of trade loss would probably be well under one percent.

## 3.5 Conclusion

When empirical estimates concerning all the relevant factors are taken into account, the conclusion is that the net effect of the FTA on the Canadian to US dollar real exchange rate is likely to be small. An increase in capital inflows is likely to result from the FTA, but it would probably not raise the exchange rate by more than two or three cents from where it would otherwise have been. There is also a slight negative terms of trade effect which would occur gradually as tariffs are reduced during the ten year phase in period, but tariffs are already very low, and this effect is likely to be too small to be measured. Perhaps the largest potential effect on the exchange rate would occur if the FTA reduces Canadian inflation rates relative to those in the United States, which could perhaps raise the dollar as much as an additional five cents by the late 1990s. However, this would not be a change in the real exchange rate, since it would be offset by lower Canadian production costs, and therefore it would not have any effect on the competitiveness of Canadian exporters.

## APPENDIX: ECONOMETRIC ESTIMATION OF AN EQUATION FOR FORECASTING THE US-CANADIAN DOLLAR EXCHANGE RATE

Following from the factors described above, the Canadian dollar is expressed as a function of the following indicators:

1. The ratio of the US to Canadian price indexes, as an index of purchasing power parity. It is expressed as a polynomial distributed lag. This structure reflects the lengthy time period needed for trade flows to adjust to changes in relative prices. Where established commercial and trading relationships exist, people are inclined to wait a while to change their buying patterns when an exchange rate change takes place. Initially, they will not respond, because they expect that the exchange rate change may be temporary (as part of this, importers will cut their profit margins when the Canadian dollar depreciates). Subsequently, when they conclude that the change is long-lasting, it will take quite a few years to fully adjust to it, since in some instances this requires building new capacity to produce more in the country whose exchange rate has declined.

2. The total value of capital flows into Canada, expressed as a fraction of GNP to normalize it.

3. The total value of dividend and interest payments, and also expressed as a fraction of GNP or merchandise exports.

Table 3.1 displays a set of regression results for alternative specifications using three different price indexes. The equations were estimated with an MA term for autocorrelation correction. The constant term was insignificant, and so was dropped.

Capital flows and interest/dividend payments are also included via distributed lags of their past values. This reflects the fact that their effect on the exchange rate is not instantaneous, but rather works itself through over a

TABLE 3.1

Alternative Regressions Explaining the Canada-US Exchange Rate

| | Relative Price | Change in Relative Price | Net Capital Flows | Interest and Dividend Payments (% of GNP) | Interest and Dividend Payments (% of Exports) | MA | $\bar{R}^2$ | DW | Out-of-Sample RMSE When Estimated to 83:4 |
|---|---|---|---|---|---|---|---|---|---|
| Mean Value 1972-1987 | 87.0 | -1.6 | 0.021 | 0.036 | 0.15 | | | | |
| 1. Based on Relative GNE Deflators | 1.13<br>(81.7) | -0.7<br>(-5.5) | 106.7<br>(6.6) | -482.4<br>(-22.0) | - | 0.81<br>(5.2) | 0.984 | 1.63 | 1.9 |
| 2. Based on Relative GNE Deflators | 1.06<br>(31.5) | -1.8<br>(-5.8) | 391.0<br>(10.9) | - | -140.6<br>(-7.8) | 0.68<br>(4.2) | 0.945 | 1.34 | 4.9 |
| 3. Based on Relative GNE Deflators | 0.83<br>(66.3) | -2.0<br>(-7.2) | 336.6<br>(8.8) | - | - | 0.96<br>(6.5) | 0.927 | (1.92) | 3.6 |
| 4. Based on Relative Producer Prices | 1.18<br>(117.5) | - | - | -409.8<br>(-20.5) | - | 0.98<br>(7.0) | 0.974 | 1.79 | 1.2 |
| 5. Based on Relative Mfg Wages | 0.987<br>(125.0) | - | 78.7<br>(6.2) | -112.0<br>(-8.2) | - | 0.95<br>(6.5) | 0.987 | 1.68 | 2.0 |
| 6. Based on Relative Mfg Wages | 1.00<br>(77.1) | - | 144.4<br>(8.2) | - | -50.8<br>(-6.9) | 0.87<br>(5.9) | 0.986 | 1.72 | 1.7 |

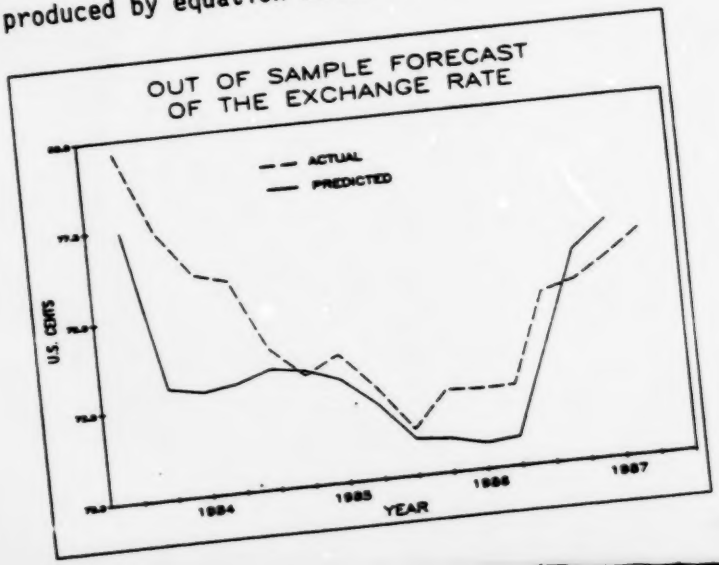
T-Statistics are in parentheses. Distributed lags on relative price were from t-4 to t-12, except in Equation 4, where they were from t to t-8. Distributed lags on interest payments were from t to t-4, and on capital flows from t-4 to t-8 (in Equations 1 and 4) or t-1 to t-8 (in Equations 2, 3 and 6). All polynomials were of second degree. Interest and dividend payments are expressed as a fraction of GNP in Equations 1, 4 and 5; and as a fraction of exports in Equations 2 and 6. Equations were estimated with quarterly data from 1974:1 to 1987:3. A first-order MA error correction was used.

period of time. The value of the exchange rate at any point in time never depends purely on objective demand and supply factors. One can think of two elements responsible for this deviation. The first, which creates an inertia in market values, is what Keynes described as "conventional valuation," meaning that the price of financial instruments is influenced by the recently prevailing views about their value.[10] The existence of conventional valuation, modelled by distributed lags, does not violate the concepts of market efficiency and market rationality, since there remains a large margin of error in predicting the next period's value even when all the past values of the explanatory variables are known.

The coefficients in the equations are not entirely satisfactory, as is indicated by the considerable change in their values in different specifications. The coefficients on the capital inflows versus interest payments variables are indicating quite different implicit export elasticities. This is probably because the latter is picking up some of the negative effects of the high real interest rate of the past several years (with which it is correlated) on capital inflows. No satisfactory specification which could avoid these biases was found.

The relatively low RMSE's of these equations when estimated to the end of 1983, and then used for out-of-sample forecasting, is fairly gratifying. For almost all regressions which I tried, the out-of-sample RMSE was considerably lower than the RMSE of 6.3 which the "random walk" forecast would have had. This supports the view that Meese and Rogoff's (1983) conclusions about the failings of empirical exchange rate models are less applicable to Canada. The out-of-sample forecast produced by equation number 1 is displayed in Chart 3.

Chart 3



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## NOTES

1. Canada also had a nominally flexible exchange rate in the 1950 to 1961 period, but in practice the Bank of Canada only allowed it to vary within fairly narrow limits.

2. For example, when the dollar fell to 69 U.S. cents in February of 1986, this type of fundamental analysis allowed us to confidently predict a medium-term recovery, even though the precise timing of this recovery could not be predicted.

3. This is only approximately true. The current account deficit does not need to be identical to the capital account surplus in any one year, since the difference can be made up by additions to or reductions from the government's foreign exchange reserves.

4. The US price index is the numerator and its Canadian counterpart is the denominator. Therefore, if higher inflation in Canada causes the Canadian price level to rise relative to the price level in the United States, this ratio will indicate the resulting decline in the relative purchasing power of the Canadian dollar.

5. See Spiro (1984) for data on the historical deviations of the Canadian dollar from PPP relative to various currencies. The PPP concept has been criticized due to the wide fluctuations of the US dollar in the past few years, but the authoritative surveys by Dornbusch (1987) and Frankel and Meese (1987) conclude that it is a valid long-run measurement of the value of a currency. (The latter reject the criticisms of PPP based on the random walk hypothesis, finding that those econometricians who have relied on this have used too short a historical sample to adequately test for the validity of PPP.) Empirical studies have generally found that PPP holds better between Canada and the United States than between any other two countries. See Officer (1980), Rush and Husted (1985) and Williamson (1987) for some recent studies related to the Canadian dollar.

6. The real exchange rate in this context is defined as the value of the Canadian dollar in US cents divided by the normalized ratio of the US to Canadian price indexes.

7. This value of 77 to 80 cents already includes the beneficial effects of free trade on capital inflows. In the 1984 to 1986 period, the Canadian dollar was below its PPP value, because of sub-normal capital inflows. Based on relative GNP deflators, some people estimate that the current PPP value may be as high as 85 US cents. However, these people are forgetting that the Canadian "GNP deflator" is really a GDP deflator, and is incompatible with the US definition. When Statistics Canada switched over to the GDP methodology in 1986, they shaved a full five percentage points off the cumulative price increase between 1971 and 1985. Therefore, the Canadian GDP deflator understates the relative Canada-US inflation rate.

8. This assumption was incorporated in the forecast of the exchange rate in the Free Trade alternative scenario by the University of Toronto's Institute for Policy Analysis, presented at their December 11, 1987 conference. They predicted that the Canadian dollar would decline by about 3 percent in the mid-1990s.

9. Wharton Econometrics (1987, p. 227), based on tariff data from the Ontario Ministry of Industry and Trade.

10. For a recent application of this principle, see Shiller (1985).

# 4.0 THE IMPACT ON SPECIFIC ONTARIO MANUFACTURING INDUSTRIES

## 4.1 Introduction

The objective of this chapter is to assess the economic impact of the recent free trade agreement with the United States on the manufacturing industries in Ontario over the next ten years. The chapter assumes that the phased-in elimination of tariff barriers will commence in 1989 and all tariffs will be removed by 1998. Appendix A presents a summary of the proposed changes agreed upon by the Canadian and US governments in December 1987.

There are very few published reports to date that deal explicitly with the impact of free trade on the manufacturing industries in Ontario. This is partly because there is no generally accepted methodology for determining the free trade impacts and partly because it is very difficult to separate the impact of free trade from other effects. There are many economic, financial and market factors which are not related to free trade, but which are also important in affecting the future performance of particular industries and firms. These factors are interrelated so that it is a challenge to isolate the impact due to free trade with the United States.

In this study, an attempt was made to quantify the impact of free trade on the two-digit manufacturing industries in Ontario. Factors that were taken into account include the direct effects of tariff removal and other associated macro-economic effects such as investment, productivity and the Canada-US exchange rate. The relative trade performance and production costs between Ontario and the United States were also reviewed to determine the competitiveness of the affected industries. Special focus was made on 9 industries of particular importance to Ontario Hydro. In 1985, these 9 major electricity users together accounted for about 85 percent of purchased electricity consumption in the manufacturing sector in Ontario. These industries are:

- Primary Metals
- Paper and Allied Products
- Chemical and Chemical Products

- Transportation Equipment
- Non-Metallic Mineral Products
- Food and Beverages
- Metal Fabricating
- Electrical Products
- Petroleum and Coal Products

## 4.2 Research Methodology

The work presented in this study reflects earlier research and on-going monitoring activities of the Economics and Forecasts Division on this important subject. A special study entitled "Ontario Manufacturing Competitiveness Relative to the United States", which was prepared in September 1987, makes extensive comparisons of various indicators of competitiveness. An industry report entitled "Ontario Manufacturing Industry Briefing Binder", completed in December 1987, also provides detailed industry analysis of the manufacturing industries in Ontario. The trade-related data used in this study were provided by the Ontario Ministry of Industry, Trade and Technology. The tariff-related data were taken from a report recently released by the Department of Finance.

One major challenge in this study was to design an appropriate methodology for assessing the direct effects of tariff removal and other associated macro-economic effects in the economy due particularly to free trade with the United States. The direct impact of tariff removal for an industry depends on a number of factors. These include the existing tariff levels in Canada and the United States, the sensitivity of export and import demand to price changes, the phase-in schedule for tariff elimination, and the cost competitiveness of the Ontario manufacturing industries relative to the US industries. Appendices 2 and 3 present the key parameters and data sources of these variables. Using these estimates, the impact of free trade on industry output was estimated in the following 3 steps:

**Step 1: Estimation of Direct Impact of Tariff Removal**

For the purposes of this study, it was assumed that tariff removal would be reflected as changes in export and import prices. Estimates of tariff rates were taken from a study prepared by the Department of Finance, while the export and import price elasticities were supplied by the Ontario Ministry of Industry and Trade. Using these estimates along with the phase-in schedules, import replacement assumptions, and the base case projection of export and import levels over the 1989-1998 period, the expected changes in exports and imports were computed for each of the 2-digit manufacturing industries in Ontario. The 1979 Ontario input-output multipliers developed by Statistics Canada for Ontario Hydro were then applied to these estimates to obtain the impact of tariff removal on industry output (in terms of Gross Domestic Product at factor cost).

**Step 2: Estimation of Macro-economic Effects Due to Free Trade**

In order to capture other associated macro-economic effects due particularly to free trade, a separate simulation of the Economics and Forecasts Division's ONTEC macroeconomic model of the Ontario economy was undertaken to estimate the effects of increased investment, improved productivity and a higher exchange rate, which are expected to result from free trade. The results of this simulation were passed through an industry forecasting model using the 1979 input-output framework to derive the additional macro effects relative to the base case on industry output for each of the 2-digit manufacturing industries in Ontario.

**Step 3: Estimation of Total Impact Due to Free Trade**

The estimates obtained from Step 1 and Step 2 were added together to obtain the total impact due to free trade relative to the base case. The results were then carefully analyzed and fine-tuned where appropriate by industry analysts who closely monitor specific industries.

Table 4.1

Total Impact of Free Trade on Industry Output
( % Difference Relative to Base Case in GDP)

| Industry | 1989 | 1993 | 1998 |
|---|---|---|---|
| Food & Beverages | 0.2 | 0.7 | 1.1 |
| Tobacco Products | 0.5 | 1.1 | 1.6 |
| Rubber & Plastics | -0.2 | 1.1 | 2.0 |
| Leather, Textile & Clothing | -0.4 | 1.3 | 3.3 |
| Wood | 0.4 | 1.8 | 3.4 |
| Furniture & Fixtures | 0.1 | 1.0 | 2.7 |
| Paper & Allied | 0.0 | 1.7 | 3.7 |
| Printing & Publishing | -0.7 | -1.2 | 2.0 |
| Primary Metals | 1.3 | 3.6 | 4.6 |
| Metal Fabricating | 0.3 | 1.3 | 2.1 |
| Machinery | 0.3 | 0.2 | 2.3 |
| Transportation Equipment | 0.5 | 2.5 | 2.5 |
| Electrical Products | 0.5 | 2.1 | 3.4 |
| Non-Metallic Mineral | -0.3 | 2.2 | 4.8 |
| Petroleum & Coal | 0.5 | 2.2 | 3.5 |
| Chemical Products | 0.2 | 1.9 | 3.2 |
| Miscellaneous | 0.1 | 2.7 | 4.2 |
| Total Manufacturing | 0.3 | 1.7 | 2.9 |

## 4.3 Summary Of Findings

Throughout the study, it was recognised that there are always uncertainties associated with quantitative estimates for the future. The analysis was based on limited information available at this point in time. Additional improvements could be made to the estimates as more up-to-date data become available. Anybody making further use of the estimates should be cautious.

Table 4.1 presents the impact of free trade on industry output compared to the base case for 1989, 1993 and 1998. The early impact on some industries is expected to be negative, because of the rise in the value of the Canadian dollar, and because Canadian tariffs in most cases start out higher than US tariffs. The overall impact of free trade with the United States is expected to be beneficial to the manufacturing industries in Ontario over the next ten years. The output of all manufacturing industries in Ontario is forecast to increase by 2.9% in 1998 relative to the base case. Key industries that are

expected to benefit more than the overall manufacturing average include primary metals, non-metallic minerals, paper and allied products, petroleum and coal products, electrical products, and chemical products. As our industry studies show, many segments of these industries are currently cost competitive with the US industries and the, ould be well positioned to benefit from the free trade agreement with the United States. The nine industries identified for special focus in this study together are expected to account for about 80 percent of the additional increases in output due to free trade with the United States over the next decade.

## 4.4 Assessment by Industry

The following is a brief assessment of the free trade impact on the 9 key manufacturing industries selected for special focus in this study:

### 4.4.1 Primary Metals

Under the proposed free trade agreement, tariffs for ferrous alloys, specialty steel and other iron and steel products will be phased out in ten years. The average tariff rate for the primary metals industry in Canada (3.8%) is marginally higher than that of the US rate (2.7%).

The primary metals industry in Ontario is cost competitive with the United States. Our special study shows that the industry has over 15% unit cost advantages over its US competitors after exchange rate adjustments. This cost advantage has been reflected in strong trade performance, Ontario has maintained a sizable trade surplus with the United States during the last 10 years.

The primary metals industry in general and the steel industry in particular is expected to benefit significantly from the free trade agreement. Since most non-ferrous metals producers are already exporting in large quantities to the United States at low tariff rates, freer trade with the United States is only expected to result in marginal gains for the Ontario producers. For the steel producers, US protectionist measures on steel imports have been a major con-

straint for the export market. The free trade agreement will help minimize the possibility of being included in any voluntary restraint agreements on steel imports with the United States in the future. Major modernization projects are underway in Ontario to improve product quality and productivity, and the steel industry will be well positioned to compete in a freer trade environment.

On balance, the output of the primary metals industry is expected to be 3.6% higher than the base case in 1993 and 4.6% higher in 1998.

### 4.4.2 Paper and Allied Products

Tariffs for pulp and paper products will be phased out in the next 5 years under the proposed free trade agreement with the United States. However, tariff rates vary significantly between different segments. Pulp and newsprint products are basically duty free already in Canada and the United States, while duties for writing papers, paper boxes and bags, and paperboards are considerably higher. The average tariff rate for the industry in Canada is about 4.4%, compared with 0.5% in the United States.

The paper and allied product industry in Ontario has had an excellent trade performance in the last decade, with the value of exports consistently triple that of imports. Almost all exports (98%) from Ontario, mostly pulp and newsprint, are shipped to the United States. In terms of production costs, the Canadian and US producers are roughly the same after exchange rate adjustments. For individual products, however, pulp and newsprint segments are much more competitive with the United States than other non-commodity segments such as writing papers, paper boxes and bags, and paperboards. These domestically-oriented segments will have to face stronger competition with the United States when the free trade agreement is implemented.

Overall, the paper and allied products industry is expected to gain from the free trade agreement with the United States. Additional growth can also be attributed to stronger economic performance domestically as a result of free trade. Industry output is expected to be 1.7% higher than the base case in 1993 and 3.7% higher in 1998.

### 4.4.3 Chemicals and Chemical Products

The Canada-US free trade agreement will eliminate all tariffs on chemicals and chemical products traded between the two countries. Most tariffs will be phased out over a five-year period. The Ontario chemical and chemical products industry is generally considered competitive with the United States and many products are already traded freely. We estimate that tariff protection for the products of this industry averages 5.9% in Canada and 3.9% in the United States.

Intraindustry trade is high in the chemicals and chemical products industry and rising levels of export orientation and import penetration over the past several years suggest that the industry's trade orientation has been increasing. Free trade would enforce this trend and enable Ontario producers to realize further scale economies, make use of excess capacity and reduce unit costs. Ontario producers have slightly higher labour costs than their US competitors but enjoy lower material costs, have modern world-scale plants, a skilled work force and a secure supply of natural resources.

The inorganic chemicals and plastics and synthetic resin segments are expected to perform very well under free trade. Only the organics and certain specialty chemicals are not considered competitive and may lose market share to US producers. The agricultural chemical segment is expected to be relatively unaffected by free trade as it is currently suffering from poor world-wide demand due to weak farm incomes.

On balance the chemical and chemical products industry is expected to gain from free trade, not only as a result of increased exports to the United States, but also due to higher domestic demand resulting from a stronger overall economic performance under free trade. By 1993, real GDP in this industry will be 1.9% higher than the base case, and by 1998 it will be 3.2% higher.

### 4.4.4 Transportation Equipment

In the proposed free trade agreement, the Auto Pact of 1965 is basically maintained and the Big Three auto producers will continue to enjoy the existing arrangements. Major changes proposed include new content rule (50% of direct manufacturing costs), removal of the duty remission program by 1996 and removal of the Canadian embargo against used car imports. Tariffs for this industry will be eliminated by 1998; the average tariff rate in Canada is 1.5%, compared with 0.5% in the United States.

The transportation equipment industry in Ontario has long enjoyed lower unit labour costs and higher productivity than the United States. Our special study shows that the industry currently has more than a 15% unit cost advantage over its US competitors after exchange rate adjustments. Ontario has maintained a healthy trade surplus in the industry since 1981.

The proposed free trade agreement is not expected to affect the Ontario transportation equipment industry significantly since the auto segments have already operated under a free trade environment since 1965. The new 50% content rule for offshore auto producers, however, would likely be beneficial to the domestic parts makers. In view of the production cost advantage in Ontario, the removal of the duty remission program is not expected to affect future investment and location decisions of offshore competitors significantly.

On an overall basis, the output of the industry is expected to be 2.5% higher than the base case in 1993 and 1998.

### 4.4.5 Non-Metallic Mineral Products

Under the proposed free trade agreement, tariffs for non-metallic mineral products will be eliminated January 1, 1989. The average tariff rate for the industry is estimated to be 6.8% in Canada and 2.0% in the United States.

The industry consists of several segments with varying trade performances. For example, the abrasive and cement segments display strong trade performance and

export successfully to the US market. By contrast, glass and clay products are protected by relatively high tariffs and are net importers. Overall, Canada has a 5% total unit cost advantage in this industry, but this advantage is due primarily to the lower Canadian dollar.

The industry as a whole is expected to benefit from the free trade agreement. Output for the industry will increase by 2.2% over the base case in 1993 and by 4.8% in 1998. Unrestrained access to the US market should further improve competitiveness and economies of scale for the abrasive and cement segments. Although the clay and glass producers will face stronger competition from the United States, the negative impacts on them will be more than offset by other segments within the industry.

### 4.4.6 Food and Beverages

The Ontario food and beverage industry is protected by a series of tariff and non-tariff barriers. The average tariff rate for the industry is estimated to be 5.8% in Canada and 2.9% in the United States. Non-tariff barriers include import quotas and labelling, packaging and inspection requirements. The Canada-US free trade agreement calls for the elimination of all tariffs on food products over a ten-year period and the removal of discriminatory trade practices for wine and distilled spirits. The agreement also calls for both countries to work toward coordinating regulatory requirements so that regulations will not act as non-tariff barriers. The quota systems in both countries were not removed by the agreement, but there will be a small increase in the Ontario import quotas for the dairy, poultry and egg products industries.

The Ontario food and beverage industry has traditionally been geared to the domestic market. Export orientation and import penetration are low, at 8.6% and 10.7% respectively in 1986. Despite increases to both exports and imports over the past several years, the overall trade deficit has remained fairly stable. In 1984, unit costs were 6% higher in Canada than in the United States on an exchange rate adjusted basis. The major weakness was in labour costs, which were 46% higher in Canada. Material costs were almost equal in both countries, with a 1% disadvantage for the Canadian industry.

The aggregate cost figures mask considerable differences among the various segments in this industry group. For example, the meat products industry is considered competitive with the United States. Packaged red meat already moves quite freely between the two countries, but would benefit from the removal of the remaining trade barriers. The more highly processed cuts have higher protection and tend to be somewhat less competitive. Nonetheless, with the gradual phase-in of tariff elimination, these producers are expected to perform well under free trade. Other segments which are expected to develop special market niches and take advantage of greater export opportunities include the distillery, feed and certain segments of the miscellaneous food products industries.

The dairy and poultry producers are not considered competitive with the United States. They will remain largely protected under free trade, with only a small decline expected in Ontario production due to the increase in import quotas. The brewing industry is also uncompetitive, but has been excluded from the agreement. However, a preliminary ruling has been made by GATT which states that Canada discriminates against European alcoholic beverages. If the ruling is fully implemented, all GATT countries, including the United States, would have increased access to the Canadian market. This would be expected to impact the brewing industry severely. The wine industry is expected to suffer a major setback under the free trade agreement with strong competition from US wineries. The implementation of the GATT ruling would further intensify the problems of the domestic wine industry.

In spite of the negative direct impact of tariff removal, most producers are expected to enjoy increased demand due to higher real personal income in Canada as a result of Canada-US free trade. Overall real GDP in the food and beverage industry is expected to be 0.7% higher than the base case in 1993 and 1.1% higher by 1988.

### 4.4.7 Metal Fabricating

The average Canadian tariff rate protecting this industry is about 6.8%, compared with 3.0% in the United States. Using a straight-line method, tariffs for both countries will be removed over a ten-year period commencing January 1, 1989.

The industry's trade performance has improved and Ontario's share of the American market has increased steadily over the last decade. However, the improved trade performance can be attributed more to the lower Canadian dollar and the industry's relatively high tariff rate than to unit cost advantages.

The industry is heavily dependent on the construction and automotive industries. Since the auto industry purchases over one-third of total metal fabricating shipments, the implications of free trade for the industry depend directly upon the type of trade agreement reached concerning the auto industry. The 1965 Auto Pact agreement remains basically the same under the proposed free trade agreement, with the exception of a new rule of origin based on 50% of direct production costs. This new formula should provide increased opportunities for Canadian parts manufacturers and lead to greater demand for fabricated metal products. Thus the free trade agreement will likely have a beneficial impact on this industry; industry output is expected to increase by 1.3% over the base case by 1993 and 2.1% by 1998.

### 4.4.8 Electrical Products

The Canada-US free trade agreement will eliminate all tariffs in the electrical products industry. Currently, the average Canadian tariff rate (7.7%) for electric products is higher than the US rate (4.2%). Tariffs in this industry will be removed in five equal stages commencing January 1, 1989, with the exception of computer equipment which will be eliminated on January 1, 1989.

The industry consists of several segments with varying cost and trade performances. The communication equipment segment is the major producer within this industry. It is technologically sophisticated and exhibits superior trade and

unit cost performances compared to the industry as a whole. By contrast, major appliances, television and radio producers are the smallest manufacturers, and rely heavily on Canadian trade barriers. Despite tariff protection, these segments are uncompetitive and most of the domestic market is satisfied by imports from the United States and the Far East.

Overall, the electrical products industry will benefit from the free trade agreement. The growing importance of the telecommunications and office equipment segment will more than offset the lack of competitiveness in the consumer products segment. Industry output (GDP) is expected to increase by 2.1% over the base case in 1993 and 3.4% in 1998.

### 4.4.9 Refined Petroleum and Coal Products

The Canada-US free trade agreement contains special provisions to ensure that energy resources are freely traded. Any future restrictions of supply or changes in licenses or fees must not disrupt normal trade patterns between Canada and the United States. For example, if production of an energy resource is reduced by government action in Canada, the proportion of total Canadian output which is exported to the United States must be maintained.

At present there is little tariff or non-tariff protection of this industry in either country. The average tariff rate on petroleum and coal products is estimated to be 0.6% in Canada and 0.5% in the United States. The Canadian industry has traditionally placed a strong focus on the domestic economy largely because of the issue of security of supply. The export orientation of Ontario refiners has shown a slight upward trend in recent years to 10.0% in 1985, while import penetration has traditionally been about 4.5%. The overall trade balance has been positive, with the exception of 1986 when world oil prices fell sharply and the reduction in refiners' purchase costs was passed through to refined products more quickly in the United States than in Canada.

Despite the positive trade balance, the Ontario refining industry is generally not considered competitive with its US counterpart. In 1984, on an exchange rate-adjusted basis, Canadian producers had a 26% cost disadvantage. This is

partly due to severe scale diseconomies due to the small scale of Canadian refineries. However, it is generally felt that Canada is at a cost disadvantage of 10% to 15% even for large scale plants, because of climatic and capital cost factors.

With its secure supply of resources and existing excess capacity, the Ontario industry may be able to lower unit costs and realize economies of scale under free trade. More important than the removal of any remaining tariff barriers is the fact that the agreement places less emphasis on domestic security of supply and more on mutual supply security in an integrated North American energy market. The assured access to the US market without fear of future US protectionist measures may encourage Ontario producers to increase their exports of refined petroleum and coal products. At the same time, greater economic growth in Canada will increase demand for the output of this industry so that producers may achieve further economies of scale and increased competitiveness. In the first year of the agreement real GDP in this industry is expected to increase by 0.5% over the base case outlook. As the benefits to the overall economy increase, the real GDP of Ontario refined petroleum and coal products industry will rise by 2.2% over the base case in 1993 and by 3.5% in 1998.

## APPENDIX A

## PROPOSED FREE TRADE AGREEMENT

The following is a summary of the proposed changes to the rules and regulations of Canada-US trade as we understand it at the present time. The information below is based on the "Elements of the Agreement" and the final text of the agreement released in October and December 1987 respectively.

### Elimination of Tariffs

- All bilateral tariffs on goods meeting the rules of origin will be eliminated.

- Dutiable products will be assigned into 3 categories for duty elimination: immediate elimination on January 1, 1989, elimination in 5 years, and elimination in 10 years.

- Existing rules on specialty steels and western red cedar shingles will not be terminated early.

### Import and Export Restriction

- Canada and the United States agreed not to maintain or introduce import or export restrictions except in accordance with the GATT.

- All existing restrictions will be eliminated, immediately or by an agreed time table, eg, used automobiles and aircraft and lottery materials.

- Neither party will use standards and regulations as a barrier to trade, except in cases concerning health, safety, environmental, national security and consumer protection reasons. But these measures must not operate to exclude goods that meet these objectives.

Agriculture

- All agricultural tariffs will be eliminated within 10 years. (However, certain segments will continue to be protected by quotas).
- For fruits and vegetables, a conditional snapback provision to the MFN rate of duty will be allowed for 20 years.
- Canada has agreed to stop requiring import licenses for wheat, barley and oats and their products as soon as the support levels of these products in both countries are equivalent.
- Canada has agreed to eliminate its Western Grain Transportation Rail subsidies on agricultural products shipped to the United States.
- Canada has agreed to increase its global import quotas for poultry and eggs to the annual average level of actual imports during the past five years.
- Canada and the United States have agreed to eliminate import restrictions for meat imports.

Wine and Distilled Spirits

- The agreement does not cover beer or malt-containing beverages.
- Both parties will grant national treatment for listings of products immediately.
- For wine, the differential in markup will be eliminated in seven years.
- All discriminatory markups and pricing measures on distilled spirits will be eliminated immediately.

Energy

- The agreement ensures non-discriminatory access for the United States to Canadian energy supplies and secure market access for Canadian energy exports to the United States.

- Both parties have agreed to prohibit restrictions on imports or exports, including quantitative restrictions, taxes, minimum import or export price requirements or any other equivalent measure, subject to very limited exceptions.

Automotive Trade

- Both parties have agreed to eliminate tariffs on original equipment and tires in 10 years and aftermarket parts in five years; phase-out import restrictions on used cars in five years; terminate duty remission programs linked to exports immediately; not grant any other duty waivers and not expand existing arrangements; and change duty drawback and foreign trade zones.

- Canada has agreed to terminate production-based duty remission programs by 1996 and not to allow additional vehicle producers under the Auto Pact.

- Vehicles traded will be subject to a special new rule of origin based on 50% of direct production cost.

Services, Investment and Financial Services

- Both parties agreed to extend national treatment to specific commercial services: agriculture, forestry, mining, construction, distributive trade, insurance, real estate, computer, travel, management and certain professional services.

- Canada has agreed to raise the review threshold for direct acquisitions to $150 million by 1992.

- Both parties agreed to provide national treatment on the establishment of new businesses and the conduct, operation and sale of established businesses.

- Canadian banks will be able to underwrite and deal in securities of Canadian governments and their agents.

- Canadian financial institutions will receive equitable treatment with respect to amendments to the Glass-Steagall Act.

- US bank subsidiaries will be exempt from the limitations on the total domestic assets of foreign bank subsidiaries in Canada.

Cultural Industries

- Cultural industries are exempt from the investment provisions of the agreement.

Dispute Settlement Mechanism

- A Canada - United States Trade Commission will be established to resolve disputes pertaining to implementation and enforcement of the free trade agreement.

- A binational panel will be established with binding powers that guarantee the impartial application of their respective anti-dumping and countervailing duty laws.

- Both parties agreed to develop within the next seven years a substitute system of rules for anti-dumping and countervailing duties, including a mutually agreed definition of subsidies. The definition of subsidies could potentially affect electricity pricing, since there have been allegations that electricity generation in Canada is subsidized. Any predictions about these negotiations would be highly speculative.

## APPENDIX B

### KEY PARAMETERS USED IN THE ESTIMATION

| Industry | Export Price Elasticities | Import Price Elasticities | Average US Tariff Rate | Average Cdn Tariff Rate | Phased-in* Assumptions |
|---|---|---|---|---|---|
| Food & Beverages | 1.0 | 1.0 | 2.9 | 5.8 | C |
| Tobacco Products | 0.7 | 0.7 | 20.7 | 16.5 | C |
| Rubber & Plastics | 2.4 | 3.3 | 4.5 | 9.3 | C |
| Leather | 1.5 | 1.6 | 7.1 | 12.7 | A |
| Textile | 1.5 | 1.0 | 6.9 | 11.6 | C |
| Knitting Mills | 1.0 | 1.0 | 12.3 | 22.7 | C |
| Clothing | 3.0 | 3.4 | 10.9 | 19.7 | C |
| Wood | 1.0 | 1.0 | 0.5 | 2.4 | B |
| Furniture & Fixtures | 3.0 | 2.7 | 2.0 | 12.5 | B |
| Paper & Allied | 1.0 | 1.2 | 0.5 | 4.4 | B |
| Printing & Publishing | 3.0 | 2.0 | 0.6 | 2.7 | B |
| Primary Metals | 2.0 | 1.8 | 2.7 | 3.8 | A |
| Metal Fabricating | 3.0 | 2.9 | 3.0 | 6.8 | C |
| Machinery | 1.5 | 1.0 | 2.6 | 4.8 | B |
| Transportation Equip. | 3.0 | 2.0 | 0.5 | 1.5 | C |
| Electrical Products | 1.5 | 0.9 | 4.4 | 7.7 | B |
| Non-Metallic Mineral | 2.0 | 1.7 | 2.0 | 6.8 | A |
| Petroleum & Coal | 1.0 | 1.0 | 0.5 | 0.6 | A |
| Chemical Products | 3.5 | 2.0 | 3.9 | 5.9 | B |
| Miscellaneous | 1.8 | 1.4 | 4.0 | 4.8 | C |

* A - denotes immediate, B - for 5 years, C - for 10 years

Source: Elasticity data provided by the Ontario Ministry of Industry and Trade. Tariff data estimated from detailed tariff rates prepared by the Department of Finance.

# APPENDIX C

## DATA SOURCES FOR THE KEY PARAMETERS

### i. Existing Tariff Levels in Canada and the United States

The average tariff levels for each of the 20 manufacturing industries in Canada and the United States were taken from a recent study entitled "The Canada-US Free Trade Agreement - An Economic Assessment" prepared by the Department of Finance. Only the tariff rates were used; other standing barriers such as quantitative restrictions and federal procurement policies and contingent protection measures were not taken into consideration in this study. The detailed tariff rates were aggregated to the 2-digit industry levels using Ontario export and import data with the United States supplied by the Ontario Ministry of Industry, Trade and Technology.

### ii. Export and Import Price Elasticities

The export and import price elasticity estimates were obtained from the Ontario Ministry of Industry, Trade and Technology. The detailed elasticity estimates were aggregated to the 2-digit industry levels using corresponding trade data. Where appropriate, the data were adjusted to reflect the estimates of other pertinent studies.

### iii. Phase-in Schedule for Tariff Elimination

The estimates were based on the Canada-United States Free Trade Agreement documents released by the federal government in December 1987. Since the phase-in schedule was presented at detailed commodity levels, the estimates on the 2-digit levels should only be considered as a rough approximation. The tariff reduction schedule is grouped into 3 categories: immediate removal in 1989, removal over a 5-year period, and removal over a 10-year period.

iv. Cost Competitiveness of the Ontario Manufacturing Industries

A special study entitled "Ontario Manufacturing Competitiveness Relative to the United States" was prepared by the Economics and Forecasts Division in September 1987. The study makes extensive comparisons of various indicators of competitiveness for the nine major industries selected for special focus in this study. The results of this report were used to assess the degree to which Ontario producers would be able to meet greater import competition.

## 5.0 THE IMPACT ON ONTARIO ELECTRICITY DEMAND

End-use model results were used as a basis for generating estimates of the impact of the free trade agreement on electricity demand. Two major groupings of users were considered: (1) major industrial users, (2) all other users including residential, commercial and smaller industrial. Industrial use was analyzed at the two-digit level so as to better reflect the variation in electricity intensity across the industrial spectrum of the economy.

Two sets of output forecasts were used to drive electricity demand:

- Base Case (ie, status quo in US - Canada trade relations) output forecasts for Ontario's 20 two-digit manufacturing industries as well as for the economy as a whole. These serve as the underlying output assumptions of the Base Case electricity demand forecast.

- Output forecasts for Ontario's 20 two-digit manufacturing industries and the economy as a whole taking freer trade into consideration. These serve as the underlying output assumptions of the Freer Trade electricity demand forecast.

The analysis began with the calculation of Base Case electricity/GDP ratios. Using the Base Case electricity demand and output forecasts, energy/GDP ratios were calculated for six specific manufacturing industries as well as for the remainder of the economy not covered by these industries for each year in the 1989-1998 period. The assumption was then made that these ratios would continue to hold after the introduction of freer trade. In other words, for each specific manufacturing industry, and for the remainder of the economy,

$$(\text{energy/GDP})_{\text{Base Case}} = (\text{energy/GDP})_{\text{Freer Trade}}.$$

It was therefore implicitly assumed that the technology mix and efficiency assumptions underlying the Base Case forecast continue to hold for the freer trade scenario. Using the above relationship, a new electricity demand

forecast was computed by applying the revised output forecast taking the free trade agreement into account to the Base Case energy/GDP ratios.

Table 5.1 lists the relative importance of Ontario's 20 manufacturing industries in terms of electricity demand. Six key players (marked with *) account for over 75% of manufacturing demand.

The impact of freer trade on electricity demand for these six major industries is given in Table 5.2. Increases in electricity demand resulting from freer trade vary by industry. Food and beverage shows the smallest increase (1%) and primary metals and non-metallic minerals show the largest (4.5 - 5%). The cumulative effect on all six industries is an increase of about 3.5%.

Table 5.3 shows the impact of freer trade on electricity demand in the rest of the Ontario economy, ie, excluding the above six manufacturing industries. The residential, commercial and the remainder of the industrial use is included. Electricity demand is expected to increase by 3% by the end of the forecasted period.

Finally, turning to the Ontario economy as a whole, Table 5.4 shows an expected impact of about 3%, or just over 5 TW.h, ten years after the introduction of the trade agreement. The relative significance of this increase can be better appreciated by considering the 2.7% base case (ie, status quo in US-Canada trade relations) annual growth forecasted for this period. The impact of freer trade can then be seen as equivalent to advancing the expected growth in electricity demand by about one year.

TABLE 5.1

Electricity Demand by 2-Digit SIC

| 2-Digit SIC (1970/1980) | Industry | % of Total Manufacturing Demand | Electricity/GDP Ratio (GW.h/71$M) 1989 | 1998 |
|---|---|---|---|---|
| | | | 1.3 | 1.3 |
| *01/10, 11 | Food and Beverage | 5.6 | | |
| 02/12 | Tobacco Products | 0.2 | | |
| 03/15,16 | Rubber and Plastic | 3.8 | | |
| 04/17 | Leather | 0.3 | | |
| 05, 06/18, 19 | Textiles and Knitting | 2.6 | | |
| 07/24 | Clothing | 0.3 | | |
| 08/25 | Wood | 1.5 | | |
| 09/26 | Furniture and Fixtures | 0.6 | 14 | 15 |
| *10/27 | Paper and Allied Products | 18.6 | | |
| 11/28 | Printing, Publishing and Allied | 1.2 | 7.0 | 7.2 |
| *12/29 | Primary Metals | 21.3 | | |
| 13/30 | Metal Fabricating | 3.4 | | |
| 14/31 | Machinery | 1.6 | 1.2 | 1.2 |
| *15/32 | Transportation Equipment | 9.7 | | |
| 16/33 | Electrical Products | 3.1 | 4.9 | 3.6 |
| *17/35 | Non-Metallic Mineral Products | 6.4 | | |
| 18/36 | Petroleum and Coal Products | 3.9 | 7.6 | 7.8 |
| *19/37 | Chemical and Chemical Products | 14.4 | | |
| 20/39 | Miscellaneous | 1.2 | | |
| | | | 1.7 | 1.7 |
| | Economy (Excluding 6 Industries Marked by Asterisks) | | 2 | 2 |
| | Total Economy (Base Case) | | | |

TABLE 5.2

FREE TRADE IMPACT ON ELECTRICITY DEMAND BY 6 MAJOR MANUFACTURING INDUSTRIES
( TWH )

FOOD & BEV

| YEAR | BASE | FT | % INC. |
|---|---|---|---|
| 1989 | 2.01 | 2.02 | 0.19 |
| 1990 | 2.04 | 2.05 | 0.15 |
| 1991 | 2.07 | 2.07 | 0.21 |
| 1992 | 2.10 | 2.11 | 0.42 |
| 1993 | 2.13 | 2.14 | 0.69 |
| 1994 | 2.16 | 2.18 | 0.90 |
| 1995 | 2.19 | 2.21 | 0.98 |
| 1996 | 2.22 | 2.24 | 1.08 |
| 1997 | 2.24 | 2.27 | 1.17 |
| 1998 | 2.27 | 2.30 | 1.15 |

PAPER & ALLIED

| BASE | FT | % INC. |
|---|---|---|
| 10.22 | 10.23 | 0.04 |
| 10.47 | 10.41 | -0.64 |
| 11.47 | 11.38 | -0.76 |
| 11.75 | 11.77 | 0.18 |
| 12.02 | 12.23 | 1.69 |
| 12.30 | 12.65 | 2.86 |
| 12.57 | 12.97 | 3.13 |
| 12.85 | 13.32 | 3.59 |
| 13.14 | 13.65 | 3.88 |
| 13.42 | 13.92 | 3.71 |

PRIMARY METALS

| BASE | FT | % INC |
|---|---|---|
| 7.71 | 7.81 | 1.32 |
| 7.99 | 8.03 | 0.50 |
| 8.20 | 8.26 | 0.69 |
| 8.48 | 8.63 | 1.86 |
| 8.69 | 9.00 | 3.56 |
| 8.90 | 9.26 | 4.07 |
| 9.12 | 9.49 | 4.07 |
| 9.33 | 9.75 | 4.51 |
| 9.60 | 10.06 | 4.82 |
| 9.81 | 10.26 | 4.59 |

TRANSPORT. EQUIP.

| YEAR | BASE | FT | % INC. |
|---|---|---|---|
| 1989 | 4.46 | 4.48 | 0.49 |
| 1990 | 4.80 | 4.78 | -0.41 |
| 1991 | 4.99 | 4.97 | -0.36 |
| 1992 | 5.18 | 5.22 | 0.77 |
| 1993 | 5.29 | 5.42 | 2.51 |
| 1994 | 5.40 | 5.55 | 2.82 |
| 1995 | 5.50 | 5.65 | 2.74 |
| 1996 | 5.60 | 5.76 | 2.87 |
| 1997 | 5.70 | 5.87 | 2.94 |
| 1998 | 5.81 | 5.95 | 2.55 |

NON-METALIC MINERALS

| BASE | FT | % INC. |
|---|---|---|
| 2.53 | 2.53 | -0.28 |
| 2.58 | 2.54 | -1.34 |
| 2.61 | 2.58 | -1.11 |
| 2.64 | 2.65 | 0.29 |
| 2.67 | 2.73 | 2.23 |
| 2.70 | 2.80 | 3.42 |
| 2.73 | 2.84 | 3.67 |
| 2.76 | 2.89 | 4.51 |
| 2.80 | 2.94 | 5.03 |
| 2.83 | 2.96 | 4.82 |

CHEMICALS

| BASE | FT | % INC |
|---|---|---|
| 9.57 | 9.59 | 0.20 |
| 9.75 | 9.71 | -0.34 |
| 9.98 | 9.95 | -0.31 |
| 10.21 | 10.27 | 0.56 |
| 10.44 | 10.63 | 1.86 |
| 10.66 | 10.93 | 2.58 |
| 10.88 | 11.17 | 2.67 |
| 11.09 | 11.43 | 3.09 |
| 11.30 | 11.68 | 3.34 |
| 11.50 | 11.87 | 3.17 |

TOTAL FOR THE 6 INDUSTRIES ABOVE

| YEAR | BASE | FT | % INC. |
|---|---|---|---|
| 1989 | 36.51 | 36.65 | 0.39 |
| 1990 | 37.63 | 37.52 | -0.30 |
| 1991 | 39.32 | 39.22 | -0.27 |
| 1992 | 40.36 | 40.66 | 0.72 |
| 1993 | 41.24 | 42.15 | 2.22 |
| 1994 | 42.12 | 43.37 | 2.97 |
| 1995 | 42.99 | 44.32 | 3.09 |
| 1996 | 43.86 | 45.39 | 3.50 |
| 1997 | 44.78 | 46.46 | 3.76 |
| 1998 | 45.64 | 47.26 | 3.56 |

## TABLE 5.3

FREE TRADE IMPACT ON ELECTRICITY DEMAND BY THE REMAINDER OF THE ONTARIO ECONOMY (EXCLUDING INDUSTRIES IN TABLE 2)[8]
( TWH )

| YEAR | BASE | FT | % INC. |
|---|---|---|---|
| 1989 | 94.12 | 94.37 | 0.26 |
| 1990 | 97.06 | 96.97 | -0.09 |
| 1991 | 99.82 | 99.75 | -0.07 |
| 1992 | 102.74 | 103.36 | 0.61 |
| 1993 | 105.69 | 107.36 | 1.58 |
| 1994 | 108.68 | 111.41 | 2.51 |
| 1995 | 111.68 | 114.73 | 2.74 |
| 1996 | 114.68 | 118.11 | 2.99 |
| 1997 | 117.64 | 121.31 | 3.11 |
| 1998 | 120.63 | 124.23 | 2.98 |

[8] Residential, Commercial, and residual Industrial use not covered by the 6 specified manufacturing industries.

## TABLE 5.4

FREE TRADE IMPACT ON ELECTRICITY DEMAND BY THE TOTAL ONTARIO ECONOMY
( TWH )

| YEAR | BASE | FT | % INC | TWH INC |
|---|---|---|---|---|
| 1989 | 130.63 | 131.02 | 0.30 | 0.39 |
| 1990 | 134.69 | 134.49 | -0.15 | -0.20 |
| 1991 | 139.14 | 138.96 | -0.13 | -0.18 |
| 1992 | 143.10 | 144.01 | 0.64 | 0.91 |
| 1993 | 146.93 | 149.51 | 1.76 | 2.58 |
| 1994 | 150.80 | 154.78 | 2.64 | 3.98 |
| 1995 | 154.67 | 159.05 | 2.83 | 4.38 |
| 1996 | 158.54 | 163.50 | 3.13 | 4.96 |
| 1997 | 162.42 | 167.77 | 3.29 | 5.35 |
| 1998 | 166.27 | 171.49 | 3.14 | 5.22 |